Registered at the G.P.O., Sydney, for Transmission by Post as a Newspaper. Published Weekly. Price 1s.

THE MEDICAL JOURNAL OF AUSTRALIA

DEC 28 1929

VOL. II.—16TH YEAR. SYDNEY, SATURDAY, NOVEMBER 23, 1929. No. 21.

'Allenburys' PASTILLES

The Criterion of Excellence.

GLYCERINE AND BLACK CURRANT

The full value and flavour of the choice ripe black currants used, are conserved in these Pastilles. They have a demulcent and mildly astringent effect most useful in allaying simple irritations of the throat, such as are caused by too much smoking, overstrain of the voice or catarrhal conditions.

A sample package will gladly be sent to any Physician on request.

MEDICATED

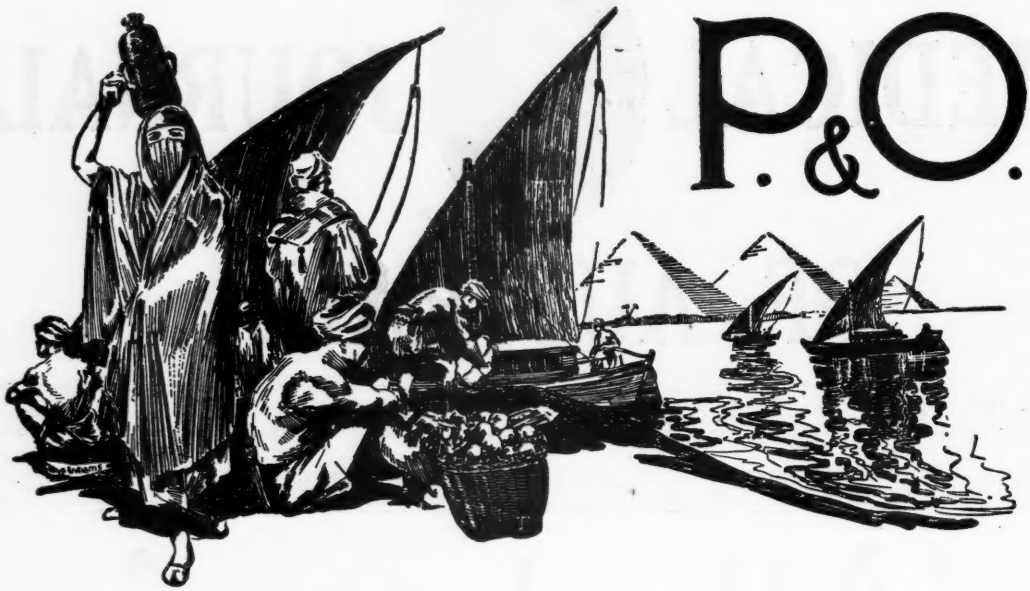
These are virtually solidified solutions or emulsions presenting the medicaments they contain in the finest possible state of division, in a bland medium.

The most general used varieties of these Pastilles are available from stock in Australia.

Further particulars and list will be sent to members of the Medical Profession on request.

ALLEN & HANBURYS (AUSTRALASIA) LTD.

13, MARKET STREET, SYDNEY, N.S.W.



P.&O.

LEAVING Australia, P. & O. Royal Mail Liners make a tour through the East to the West via many lands of historical interest. After calling at Ceylon---the Gateway of Modern India---certain P. & O. Liners now add Bombay to their list of ports. Then come Aden, Suez, Port Said and Marseilles, picturesque stepping stones to the West.

Particulars of Rates, Sailings, etc., and Literature from---

MACDONALD, HAMILTON & COMPANY—
Agents

Union House, 247 George Street Sydney
467 Collins Street Melbourne, C1

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—16TH YEAR. SYDNEY, SATURDAY, NOVEMBER 23, 1929. No. 21.

Authors of articles submitted for publication are requested to read the following instructions and to comply with them.

All articles must be typed with double or treble spacing. Carbon copies should not be sent. Abbreviations should be avoided, especially those of a technical character at times employed in ward notes. Words and sentences should not be underlined or typed in capitals. The selection of the correct type is undertaken by the Editors. When illustrations are required, good photographic prints on glossy gaslight papers should be submitted. Each print should be enclosed in a sheet of paper. On this sheet of paper the number of the figure and the legend to appear below the print should be typed or legibly written. On no account should any mark be made on the back of the photographic print. If no good print is available, negatives may be submitted. Line drawings, graphs, charts and the like should be drawn on thick, white paper in India ink by a person accustomed to draw for reproduction. The drawings should be large and boldly executed and all figures, lettering and symbols should be of sufficient strength and size to remain clear after reduction. Skiagrams can be reproduced satisfactorily only if good prints or negatives are available. The reproduction of all illustrations, but especially of skiagrams, entails the sacrifice of time and energy and is expensive. Authors are expected to take a corresponding amount of trouble on the preparation of their illustrations, whether skiagrams, photographs, wash drawings or line drawings. The references to articles and books quoted must be accurate and should be compiled according to the following scheme. The order should correspond to the order of appearance in the article. The initials and surnames of the authors, the full title of the article or book, the full (unabbreviated) title of the journal in which the article appears, the date of the issue (day, month and year) and the number of the first page should be given in this sequence.

Table of Contents

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES— PAGE.

"Supravital Staining of the Large Mononuclear Cells in Infectious Mononucleosis and the Acute Leuchæmias, with Particular Reference to Their Origin in the Former Disease," by JOHN A. MCLEAN, M.B., B.S. .. 734

"Syphilis as a Diagnostic Pitfall," by RUPERT A. WILLIS, M.D. .. 740

"Some Observations on the Tonsil," by H. H. WOOLLARD, M.D., D.Sc., and L. A. MCLEAN .. 746

REPORTS OF CASES—

"Submucous Lipoma of the Hypopharyngeal Wall," by G. A. D. MCARTHUR, M.D., B.S. .. 750

"Two Interesting Cases of Hysteria," by RALPH NOBLE, M.B., Ch.M., D.P.M. .. 751

REVIEWS—

A Book for the Diabetic .. 751
Physical Aspect of X Rays .. 752
Graphic Surgery .. 752
Medicine and the Mind .. 752

LEADING ARTICLES—

Commercial Morality .. 753

CURRENT COMMENT—

Ultra-Violet Radiation .. 754
Ureteral Repair .. 755

ABSTRACTS FROM CURRENT MEDICAL LITERATURE— PAGE.

Bacteriology and Immunology .. 756
Hygiene .. 757

SPECIAL ABSTRACT—

Radiotherapy of Cancer of the Uterus .. 758

BRITISH MEDICAL ASSOCIATION NEWS—

Scientific .. 762
Nominations and Elections .. 765

CORRESPONDENCE—

Malarial Therapy .. 765
Prolapsus Uteri .. 765
Shoe Salesmen as Radiographers .. 765

OBITUARY—

Frank Hart Barker Gaden .. 765

ADDENDUM .. 766
BOOKS RECEIVED .. 766
DIARY FOR THE MONTH .. 766
MEDICAL APPOINTMENTS .. 766
MEDICAL APPOINTMENTS VACANT, ETC. .. 766
MEDICAL APPOINTMENTS: IMPORTANT NOTICE 766
EDITORIAL NOTICES .. 766

SUPRAVITAL STAINING OF THE LARGE MONONUCLEAR CELLS IN INFECTIOUS MONONUCLEOSIS AND THE ACUTE LEUCHÆMIAS, WITH PARTICULAR REFERENCE TO THEIR ORIGIN IN THE FORMER DISEASE.

By JOHN A. McLEAN, M.B., B.S.,
From the Baker Medical Research Institute, Alfred Hospital, Prahran.

THE differentiation of large mononuclear cells with non-granular cytoplasm which may conceivably be myeloblasts, lymphoblasts, monoblasts or lymphocytes, is difficult and, without supplementary methods, often impossible in an examination of fixed blood films stained by one of the Romanowsky methods. Various criteria, such as the structure of nuclear chromatin, the number of nucleoli, the intensity of staining of nucleus and cytoplasm, have been laid down, but the application of these standards to an isolated mononuclear cell is usually unsatisfactory. In many cases the presence of more mature cells of the particular series enables one to decide as to the identity of the more primitive and less differentiated cell. But there are certain diseases of the blood-forming tissues, such as glandular fever and acute myeloid leuchæmia, in which there is only one type of mononuclear cell present, and it is in these cases that supravital staining is of most value.

LEGENDS TO ILLUSTRATIONS.

FIGURE II.

Blood Film, Case I.—"Lymphendotheliocyte," showing two nuclei.

FIGURE III.

I: "Lymphendotheliocyte" from Case I, showing rosette of neutral red granules.
II: Rosette cell from lymphatic gland in Case I.
III: Clasmatocyte from lymphatic gland in Case I, showing neutral red granules and a large vacuole.
IV: Adult lymphocyte from lymphatic gland, Case I.
V: Polymorphonuclear leucocyte drawn as the cell was exhibiting amœboid movement.
VI: Myeloblast from Case II, showing the general distribution of mitochondria which are stained with Janus green.
VII: Myelocyte *A* from Case II, showing first appearance of neutral red granules.
VIII: Myelocyte *B* from Case II, showing a greater number of neutral red granules and fewer mitochondria.
IX: Myelocyte *C* from Case II, showing full complement of neutral red granules and absence of mitochondria.
X and XI: Lymphoblasts from Case III, showing clumping of mitochondria.
R: Red blood corpuscles.

FIGURE IV.

Section of Lymphatic Gland in Case I, showing small lymphocytes and large cells with round or oval vesicular nuclei.

FIGURE V.

Section of Lymphatic Gland, Case I, showing swollen endothelium of lymphatic sinuses.

FIGURE VI.

Blood Film from Case III, showing a lymphoblast, three small lymphocytes and two metamyelocytes.

By supravital staining is meant the application of certain dyes, notably neutral red and Janus green, to living blood cells. The dye which is so diluted as not to impair the vitality of the cell, is taken up in a characteristic way.

The Janus green stains the mitochondria which are present in the cytoplasm as small rod or coccus-like bodies. These mitochondria are particularly in evidence in growing cells and are characteristic in certain cells with regard to number, distribution and arrangement, as will be described later.

The neutral red appears as granules or small vacuoles which vary in number, size and distribution in different cells.

The supravital method was introduced by Sabin[1] to the study of blood cells and on using this method, Cunningham, Sabin and Doan[2] have described the development of white blood cells from reticular cells to "primitive" cells which, according to environment, differentiate into myeloblasts, lymphoblasts or monoblasts (see Scheme).

Method.

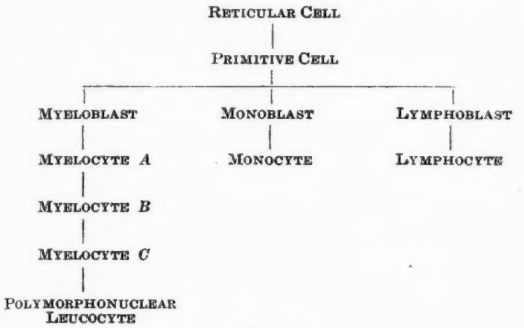
Care is to be taken in the preparation of scrupulously clean slides. The following chromic acid mixture is satisfactory. Dissolve 80 grammes of potassium bichromate in 300 cubic centimetres of warm water. When all the bichromate is dissolved and the solution cooled, 460 cubic centimetres of concentrated sulphuric acid are added slowly with constant stirring. The liquid will be quite thick with small crystals of chromic anhydride and when the crystals are used up, the liquid should be discarded.

The glass slides, after a preliminary wash with soap and water, are kept in this solution for at least twenty-four hours and are then washed thoroughly with distilled water and stored in absolute alcohol. Stock solutions of neutral red (Grübler) and Janus green (Grübler) in absolute alcohol are prepared. The neutral red solution is in the proportion of one hundred milligrammes of dye to one hundred cubic centimetres of absolute alcohol and a saturated solution of Janus green in absolute alcohol is made up.

Add 0·4 cubic centimetre of the stock solution of neutral red to ten cubic centimetres of absolute alcohol and flood the glass slides with the solution and then stand them up so that the excess stain drains off, leaving a fine film of dye deposited on the surface. Make up a neutral red-Janus green mixture by adding one to three drops of stock solution of Janus green to two cubic centimetres of the dilute neutral red solution and treat the slides in a similar way with this double stain.

A drop of blood from the patient is placed on the prepared surface of a slide and a coverslip

lowered over the drop or else a square coverslip is placed flat on a slide with the two edges in juxtaposition and the latter brought in contact with a drop of blood which flows under the coverslip by capillary suction. The coverslip is ringed with paraffin and the slide placed in the microscope



SCHEME.

incubator box (Figure I). This incubator box is a slight modification of the electrically heated warm box described by Strangeways and Canti.[3] The preparation is examined microscopically after an interval of from twenty to thirty minutes, during which time the dye is taken up by the cells.

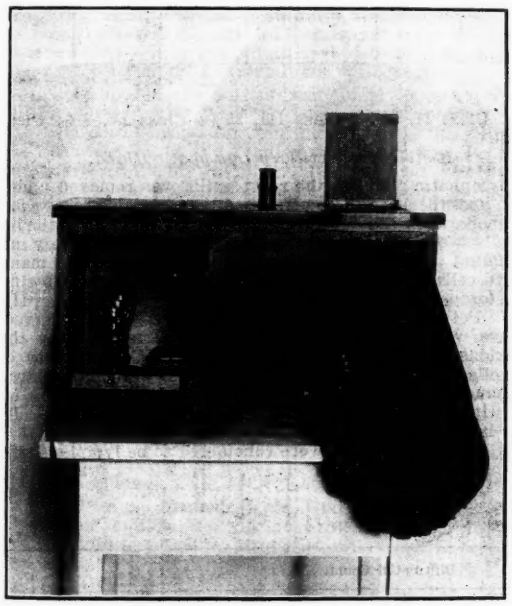


FIGURE I.
Microscope Incubation Box, showing source of heat, eyepiece of microscope, observation window and sleeve through which the microscope is manipulated.

Infectious Mononucleosis (Glandular Fever).

Clinical Notes.

A young man, aged twenty years, was admitted into hospital on March 24, 1928. He had been ill for five days and complained of abdominal discomfort, lassitude, anorexia and a slight headache. For three days stiffness and swelling of the neck had been noticed. He had had no previous illnesses and there was nothing important in the family history.

On examination the pharynx, pillars of the fauces and tonsils were seen to be hyperæmic and there were a few petechial hæmorrhages on the soft palate. The upper deep cervical lymphatic glands were enlarged and tender on pressure and were quite discrete. The axillary glands were palpable and there were slight enlargement and tenderness of a gland in the left axilla. No abdominal lymphatic glands could be palpated, although there was tenderness on deep pressure in the right iliac fossa. The superficial subinguinal glands were firm to palpation and there was definite enlargement of the glands on the left side. The popliteal glands could not be palpated.

Physical examination of the lungs and heart revealed no abnormality. The abdomen moved freely with respiration and there was slight tenderness on deep pressure in the epigastrium and right iliac fossa. The edge of the spleen was palpated during inspiration about two centimetres below the left costal margin.

The swelling of the lymphatic glands became more evident and on March 26 the submaxillary glands and the deep cervical glands posterior to the angles of the jaw were particularly enlarged. The supraclavicular glands were also enlarged and there was an increase in the size of the axillary glands, especially on the right side. There was a slight enlargement of the inguinal glands. The edge of the spleen was palpable about 3·5 centimetres below the left costal margin. On April 4 an enlarged lymphatic gland in the right axilla was removed, a smear was stained by the supravital method and the gland was fixed in Zenker's fluid for subsequent histological section.

The tenderness and to a lesser extent the enlargement of the lymphatic glands gradually subsided and the patient was discharged from hospital on April 13.

For the first eight days in hospital the average temperature as charted was 38·1° C. (100·5° F.), the maximum recorded temperature being 39·3° C. (102·8° F.). During the next five days the maximum temperature was 37·8° C. (100° F.) and subsequently the temperature remained normal (see Chart).

The routine laboratory findings were as follows:

Urine, specific gravity 1020, acid reaction, no albumin nor sugar; microscopical examination showed no abnormality.

Blood culture on peptone broth gave no growth.

Widal test and the Wassermann test failed to yield a reaction.

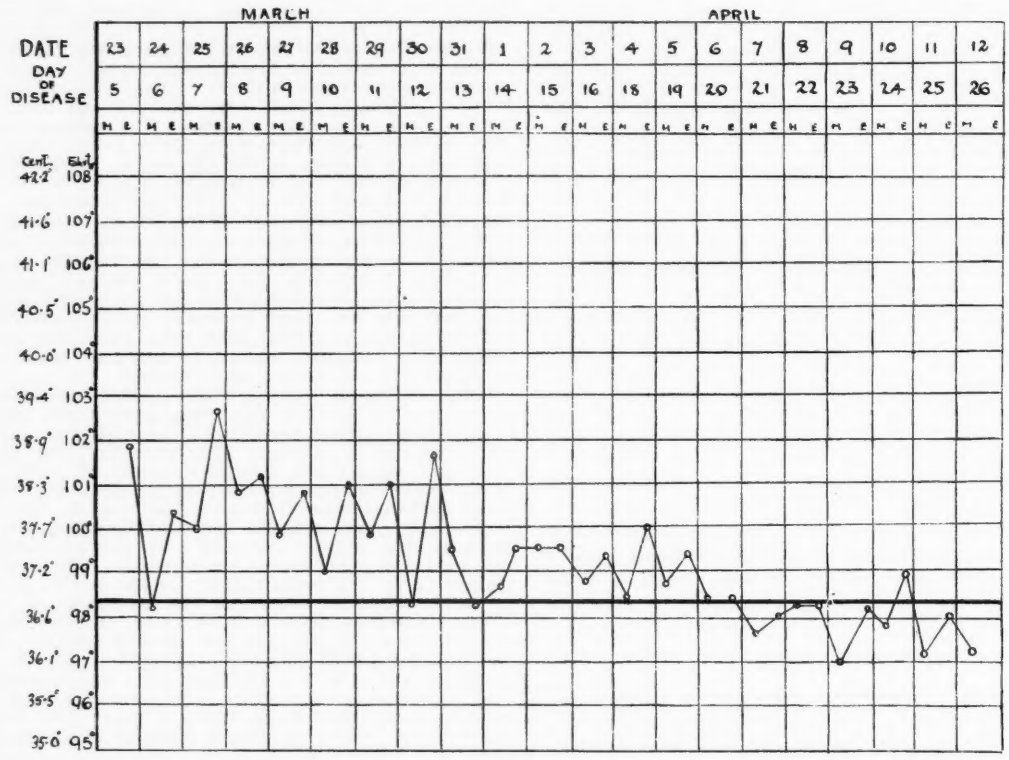
No tubercle bacilli were found in a sputum examination.

Hæmatological Examination.

The results of the blood examinations are tabulated in Table I. Films were stained respectively with Giemsa, Leishman and by the peroxidase method as described by McJunkin.[4]

Difficulty was experienced in classifying the large mononuclear cells, the great majority of which presented unusual characteristics. The average diameter of one hundred of these cells was 15 μ, the largest cell of the series being 20 μ. The nucleus was situated usually at the centre of the cell or in a slightly eccentric position. It varied in shape, sometimes being round and often irregularly indented and bilobed. One cell was observed containing two nuclei, possibly an instance of division by amitosis (Figure II). The nucleus stained a lighter purple colour and the nuclear chromatin was arranged in a looser network showing more detail than is usually the case in large lymphocytes. Two or three nucleoli were identified in the majority of these cells. The cytoplasm was relatively abundant, forming a wide, often irregular border to the nucleus and in the majority of the cells was deeply basophilic. It was non-granular except for an occasional azurophilic granule; there was no response to the peroxidase test. On April 6 67% of the total white blood cells failed to give the peroxidase reaction and 33% gave the reaction, which corresponds closely to the differential count of the Giemsa stained film.

Fresh blood smears were examined by the supravital method. Neutral red preparations only were examined, as at that time the Janus green stain was unobtainable.



On March 31 an examination showed the large mononuclear cells with the characteristic rosette of neutral red granules in the indentation of the nucleus (Figure III, 1). The granules of the polymorphonuclear leucocytes were stained by the neutral red and the typical amœboid movement of these cells was observed. The small lymphocytes showed only an occasional neutral red granule. The blood was examined again by the supravital method on April 4 and 6 and practically all the large mononuclear cells manifested the rosette arrangement. On April 12 there were very few rosette cells and on April 23 only two rosette cells were seen during an observation extending over half an hour.

Arneth's index showed a shift to the left. Thus on March 24 the following figures were obtained from a Giemsa film: Class I, 53%; Class II, 39%; Class III, 8%; Class IV, nil; Class V, nil. Four weeks later the shift to the left was not so great, the figures being: Class I, 24%; Class II, 50%; Class III, 20%; Class IV, 6%; Class V, nil.

Histology of Axillary Lymphatic Gland.

A lymphatic gland in the right axilla was removed under local anæsthesia. A neutral red supravital preparation was made from the cut surface of the gland. The majority of cells were small lymphocytes and contained only an occasional neutral red granule, but there were many rosette cells and there were also a few large cells showing the storage characteristics of clasmatocytes (Figure III, III). Polymorphonuclear leucocytes also were observed. Smears were stained with Giemsa, Leishman and by the peroxidase method. In the Giemsa film, the majority of the cells were small lymphocytes. There were many large mononuclear cells wtih relatively pale stained nuclei and fine stippled nuclear chromatin with nucleoli. These cells were larger than the usual large mononuclears, being 15 μ to 22 μ in diameter, and were considered to be lymphoblasts.

TABLE I.

Tabulation of the Results of the Blood Examinations made in Case I.

Date.	Hæmoglobin Percentage.	Red Blood Corpuscles.	White Blood Corpuscles.	Differential Count.								
				Polymorphonuclear Leucocytes.			Small Lymphocytes.	Large Mononuclear Cells (Lymphendothelliocytes).	Lymphoblasts.	Monocytes.	Metamyelocytes.	Myelocytes.
				Neutrophile.	Eosinophile.	Basophile.						
24.3.28	95	4,600,000	9,400	36	0·5	—	8·5	47	4	1	2·5	0·5
28.3.28			15,000	28	—	0·5	9	52	5	3	2	0·5
31.3.28			10,000	21	1	0·5	12	54	3	7	1·5	—
4.4.28			10,000	27	—	—	18	47	3	4	1	—
6.4.28			10,000	30	—	—	6	56	3	3	1	—
10.4.28			6,200	34	1	—	9·5	40	2	3	0·5	—
12.4.28	96	4,700,000	7,500	24	2	0·5	18·5	50	1	3	1	—
23.4.28	95	4,400,000	6,000	42	4	—	24	28	—	2	—	—

In the mononuclear cells of intermediate size the nucleus was a deeper purple and the chromatin more coarsely arranged. There were many red blood corpuscles and scattered polymorphonuclear leucocytes were present. In the peroxidase film polymorphonuclear leucocytes and occasional monocytes were observed exhibiting a positive reaction, while the lymphocytic cells and the large mononuclears yielded no reaction. Paraffin sections of the gland were cut and stained with hæmalum and eosin, Van Gieson's and Giemsa's stains respectively. Sections were stained by the Ziehl-Neelsen method and by the Gram method, but on examination no tubercle bacilli or other organisms were discovered. The normal structure of the gland was obscured by an apparent generalized proliferation of the reticulo-endothelium. Germinal centres were almost completely absent and there were no definite trabeculæ in the medulla. There were fewer small lymphocytes than normal in the meshes of the reticulum and there was an excessive number of large mononuclear cells (Figure IV). Some of these latter cells were round in shape and free, others retained protoplasmic processes attaching them to similar cells and to endothelium. The endothelial cells lining the lymph sinuses were swollen with oval vesicular nuclei (Figure V). The lymph sinuses contained in addition to small lymphocytes many large mononuclear cells and red blood corpuscles with a few leucocytes and an occasional plasma cell.

Acute Myeloid Leuchæmia.

Clinical Notes.

A young girl, aged fourteen years, was admitted into hospital suffering from general weakness and breathlessness. These symptoms had become noticeable two weeks previously and had become so extreme that even the slightest exertion while at rest in bed excited breathlessness. Previously she had been quite healthy and had had no other illnesses except an attack of tonsillitis three months before admission. With regard to menses, micturition and bowels, no abnormalities were reported.

On examination the patient was found to be extremely pallid. The apex beat of the heart was palpated in the fifth intercostal space, ten centimetres from the mid-line. The beat was rapid and regular and a soft systolic bruit was heard at the mitral area. On physical examination of the lungs no abnormalities were detected. The superficial lymphatic glands, liver and spleen were not enlarged. Her temperature was 39·4° C. (103° F.), her pulse rate was 150 and her respirations 32 per minute. The systolic blood pressure was 110 millimetres of mercury and the diastolic 65 millimetres of mercury. The specific gravity of the urine was 1008; it had an acid reaction and contained no albumin and no sugar.

Hæmatological Examination.

A blood examination was made on the day after admission with the following results:

Hæmoglobin	20%
Red blood corpuscles, per cubic millimetre	900,000
White blood corpuscles, per cubic millimetre	2,000
Colour index	1·1

A fixed film stained with Giemsa revealed slight anisocytosis and poikilocytosis of red cells, but no polychromatophilia, punctate basophilia or nucleated red cells were seen.

Differential count:

Neutrophile polymorphonuclear leucocytes	2%
Myeloblasts	18%
Premyelocytes	67%
Myelocytes	1·5%
Lymphocytes	11%

The peroxidase test (McJunkin's method) yielded 3·5% reacting cells. The granules in the cytoplasm of the cells classified as premyelocytes were few in number, coarse and purple in colour, and may be azurophilic; in that case they would not give a positive peroxidase reaction. These large mononuclear cells which predominated in the Giemsa film, averaged 17 μ in diameter. The nucleus appeared as a relatively lightly stained purple colour, the chromatin was finely stippled and there were several nucleoli, usually three to five in number. The cytoplasm was a deep blue at the periphery and less deeply basophilic adjacent to the nucleus where the purple granules were distributed.

Fresh blood was examined by the supravital method. The differences in storage of neutral red and in the number and distribution of mitochondria in myeloblasts, myelocytes and lymphocytes was demonstrated. In the myeloblast there are no neutral red granules and the mitochondria stained by Janus green are numerous and evenly distributed (Figure III, VI). The myelocyte has the capacity for taking up neutral red and, corresponding with the age of the cell, there is an increase in the number of neutral red granules and a diminution in the number of mitochondria. In the most immature myelocyte, classified by Cunningham, Sabin and Doan[2] as myelocyte *A*, there are only a few neutral red granules in a cytoplasm containing many mitochondria (see Figure III, VII). There is an increase in neutral red granules in myelocyte *B*, with a diminution in the number of mitochondria (Figure III, VIII) and in myelocyte *C* the cytoplasm is filled with neutral red granules and is practically devoid of mitochondria (see Figure III, IX). The mature polymorphonuclear cell contains only neutral red granules and exhibits amœboid movement (see Figure III, V). Mature lymphocytes were also observed. These cells contain one or two neutral red granules and in the younger cells a few mitochondria.

The differential count of supravitally stained cells was as follows:

Polymorphonuclear leucocytes	2%
Myeloblasts	17%
Myelocytes, type *A* 17% Myelocytes, type *B* 40% Myelocytes, type *C* 10%	67%
Lymphocytes	14%

This differential count corresponds closely with that of the Giemsa film and confirms the classification of the predominating large mononuclear cell as an immature myelocyte.

The patient died two days after admission and permission for a *post mortem* examination was refused.

Acute Lymphatic Leuchæmia.

Clinical Notes.

A young woman, aged twenty-four years, was admitted into hospital complaining of weakness, vomiting and epistaxis. She had had no previous illnesses and nothing of importance was elicited from inquiry into the family history. The patient had been ill for several weeks. The vomiting had been present for a week prior to admission and the epistaxis had occurred just before admission. She also complained of a feverish feeling. Her appetite was poor, bowels were regular and there were no abnormalities in micturition or menstruation.

On examination it was noted that the patient was a pale, well proportioned young woman. Her pupils were equal and reacted to light and accommodation. An ophthalmoscopic examination revealed normal fundi. There were a few hæmorrhages of the gums. Physical examination of heart and lungs showed no abnormalities. The liver and spleen were enlarged four finger-breadths and three finger-breadths respectively below the costal margin. There was a purpuric patch of the skin about twenty-five millimetres in cross section over the left medial epicondyle and several brown coloured areas on the hands and abdomen. The temperature was 36·6° C. (98° F.), the pulse rate 104 and the respirations twenty-four in the minute. The specific gravity of the urine was 1010; it was acid and contained no albumin and no sugar. Blood examination (see later) demonstrated the diagnosis to be lymphatic leuchæmia. A blood culture in bile and tryptic broth gave no growth.

Treatment by *liquor arsenicalis*, liver extract and deep X ray therapy was unavailing and the patient became rapidly worse. Ecchymoses became numerous, with bleedings from the gums and nose and there was a fall in the blood count. At Dr. Penfold's suggestion the patient was given spleen, 280 grammes (ten ounces) per day. In a few days her clinical condition improved; there were no further hæmorrhages; the liver and spleen became

smaller in size, but the temperature became high and swinging. Œdema of the feet, ascites and a pleural effusion developed and death occurred suddenly seven weeks after admission. At a *post mortem* examination the usual changes associated with an enormous infiltration of lymphocytes were observed. The liver and kidneys were pale and enlarged. The liver weighed 2·722 kilograms (96 ounces) and the right and left kidneys 255 and 280 grammes (nine and ten ounces) respectively. Microscopically both organs were found to be extensively infiltrated with lymphocytes. The spleen weighed 765 grammes (twenty-seven ounces) and was reddish-grey in colour and firm in consistency. Microscopically there was a general massing of lymphocytes, making it impossible to recognize Malpighian bodies. Lymphatic glands were slightly enlarged and microscopically germinal follicles and trabeculæ were obscured by lymphocytes which infiltrated the capsule and were in small collections in adjacent connective tissue. The bone marrow was greyish-red in colour and microscopically showed extensive infiltration of lymphocytes.

Hæmatological Examination.

A blood examination was made soon after admission. The following results were obtained:

Hæmoglobin	74%
Red blood corpuscles, per cubic millimetre	4,200,000
White blood corpuscles, per cubic millimetre	115,000

Film stained with Giemsa showed anisocytosis, poikilocytosis, polychromatophilia of red cells with scattered normoblasts.

The differential count yielded the following figures:

Neutrophile polymorphonuclear leucocytes	1·5%
Eosinophile polymorphonuclear leucocytes	0·5%
Myelocytes	0·25%
Metamyelocytes	1·0%
Small lymphocytes	91·0%
Lymphoblasts	5·5%
Monocytes	0·25%

To the oxidase test 2·8% cells gave a reaction. The lymphoblast is characterized by an immature nucleus. The nucleus is relatively lightly stained and exhibits a fine chromatin network with several nucleoli (see Figure VI). According to Naegeli[6] the number of nucleoli is of significance in differentiating myeloblasts and lymphoblasts. He states that a myeloblast has three to five nucleoli and a lymphoblast one to three. Piney[6] distinguishes these two cells by slight differences in the structure of the nuclear chromatin and by the definition of the basichromatin from the oxychromatin. Such morphological criteria are not readily applicable, but with supravital staining differences are more obvious.

In the lymphoblast there is, as Cunningham, Sabin and Doan[2] describe it, a characteristic clumping of mitochondria adjacent to the nucleus (Figure III, x and xi), while the myeloblast shows a greater number and a more even distribution of mitochondria. Further, cells of the lymphocytic series do not store neutral red except for an occasional granule in adult lymphocytes, while very early in the myeloid series neutral red is taken up into the cytoplasm.

The differential count of supravitally stained cells gave the following figures:

Polymorphonuclear leucocytes	6·6%
Myelocytes	2·0%
Lymphocytes	87·0%
Lymphoblasts	3·7%

One week after admission the blood examination yielded the following information:

Red blood corpuscles, per cubic millimetre	1,250,000
White blood corpuscles, per cubic millimetre	18,000
Hæmoglobin	19%

The count remained more or less at this level for the remaining period.

Discussion.

The disease known as infectious mononucleosis or glandular fever has exercised the minds of clinicians and hæmatologists for many years, but as yet very little light has been shed on the subject. The condition is established as a definite clinical identity, but its causation and nature are unknown. In 1914 Brienl, Priestley and Fielding[7] investigated an epidemic of glandular fever in the Mossman district of North Queensland. They successfully infected two monkeys by blood inoculation and concluded that epidemic glandular fever was in all probability an insect transmitted disease.

More recently in Australia Hislop[8] in 1925 and Smith[9] in 1926 have reported typical cases of infectious mononucleosis. In England Tidy has shown particular interest in the disease and with Daniel[10] has given an excellent account of it in a detailed report of a small epidemic in a boys' preparatory school.

Sprunt and Evans[11] from the Johns Hopkins Hospital were the first Americans to report a series of cases and have been followed by Bloedorn and Houghton,[12] Longcope,[13] Downey and McKinlay[14] and Cottrell.[15]

The clinical characteristics of infectious mononucleosis are well established. The main feature is the rapid enlargement of cervical glands and less constantly and to a lesser extent the spleen and the other lymphatic glands are enlarged. The fauces are reddened and the tonsils may be increased in size. There are constitutional disturbances, such as pyrexia, headache and vague generalized pain. The enlargement of the glands usually begins to subside in two or three weeks and the prognosis is quite good.

In a consideration of the blood picture the discussion hinges on the origin and nature of the large mononuclear cells. The consensus of opinion heretofore has been that they are of lymphatic origin. The non-granular basophilic cytoplasm is characteristic of lymphatic cells, but the size of the cells, the relatively abundant cytoplasm, the irregularly shaped nuclei and the reaction to neutral red supravital staining is indicative of the type of cell originally described by Naegeli as a monocyte. The monocyte is a large mononuclear cell with distinct linear markings of the nuclear chromatin, a dust-grey cytoplasm with fine granules giving an oxidase reaction and, according to Sabin,[1] with supravital staining showing a rosette of neutral red granules in the indentation of the nucleus.

It is evident that the large mononuclear cells in this case of infectious mononucleosis do not correspond with this description. Furthermore, Sabin states that the monocytes are not formed in lymphatic glands, but in the spleen and to a lesser extent in the bone marrow. On the other hand, many hæmatologists consider that the monocytes are either derived from or closely related to lymphatic cells.

McJunkin[4] distinguishes two types of large mononuclear cells according to their response to the peroxidase test, namely, the "transitional leucocyte" (monocyte of Naegeli) which gives a per-

oxidase reaction, and a large mononuclear which does not react to this test. This latter cell is characterized by a rosette pattern of neutral red granules with supravital staining and McJunkin has termed it the lymphendotheliocyte. Evans also has differentiated a large mononuclear cell which takes vital dyes, but does not react to the oxidase test. It would thus appear that the large mononuclear cell of infectious mononucleosis is identical with McJunkin's lymphendotheliocyte.

These cells have apparently been formed by a proliferation of the reticulo-endothelium of lymphatic glands and spleen, but the cause of this proliferation is not very evident. Possibly there is a constitutional anomaly which has altered the response to certain infections from a neutrophilia to a mononucleosis. The shift to the left in Arneth's index would indicate that there has been a demand on the bone marrow for leucocytes which, however, have not been produced in sufficient numbers, for, while there is a majority of immature neutrophile cells, there is no increase in the total number of polymorphonuclear leucocytes.

On the other hand, there may be a particular infecting organism or toxin which has a selective action on the reticulo-endothelium, particularly of lymphatic glands and spleen, stimulating it to hyperplasia.

In an investigation of a spontaneous epidemic disease in rabbits, Murray, Webb and Swann[16] isolated an organism named by them *Bacillus monocytogenes*, which produced a great increase in monocytes. These monocytes, as investigated by Witts and Webb,[17] manifested the typical rosette of neutral red with supravital staining and failed to yield an oxidase reaction and such are the characteristics of the monocyte in normal rabbit's blood as distinct from granular oxidase positive monocyte in human blood. Witts and Webb demonstrated that these cells originated from the spleen and bone marrow and they found that lymphatic glands were absolutely destitute of monocytes and monoblasts. In this respect the infection in rabbits differs from infectious mononucleosis in man and, further, all attempts to isolate any specific organism in the latter disease have ended in failure.

In Case II the supravital method demonstrated definitely the myeloid nature of the large mononuclear cells. Such a finding could not be arrived at so readily by examination of fixed films, particularly when associated with the rather anomalous peroxidase reaction. The dramatic failure of the myeloid formative tissue was impressive. A leucocyte count was very low on two occasions during the brief period in hospital and a count carried out a few days before admission was 3,200 per cubic millimetre. Associated with the almost complete absence of polymorphonuclear leucocytes there was a low red count and a film showing none of the changes in size and staining of red cells usual to such a low count.

From this point of view the diagnosis of aplastic anæmia was suggested. The absence of immature red cells, such as polychromatophilic cells and normoblasts, is significant of an aplasia of the red cell formative tissue, but the presence of immature leucocytes is against such a diagnosis. The rapidly fatal course of the disease and the characteristic blood picture confirmed by the supravital method establish the diagnosis of acute myeloid leuchæmia. Unfortunately this could not be verified by a *post mortem* examination.

In Case III the blood examination at once made the diagnosis obvious. Acute lymphatic leuchæmia differs from chronic lymphatic leuchæmia not so much in the blood picture and morbid histology as in the clinical course of the disease. The acute cases are in young people and have a short and stormy termination, while in older subjects the disease pursues a long and milder course. It is stated in text books that the large lymphocytes are more numerous in the acute cases. It is assumed that the size of the cell is an index of immaturity, but such is not the case. The aspect of the cell which is to be studied for signs of immaturity, is the nucleus. In both the lymphocytic and myeloid series the nucleus in young immature cells is relatively lightly stained and has a fine chromatin network with several nucleoli. The nucleoli in myeloblasts are usually larger and more conspicuous than in lymphoblasts, but it is doubtful whether a constant number of nucleoli is characteristic respectively of lymphoblast and myeloblast.

Lymphoblasts are more numerous in acute than in chronic lymphatic leuchæmia, but are not necessarily the predominating cell, as is exemplified in the case here reported in which small lymphocytes predominated. Recently Dr. T. E. Green[18] has reported a case of acute lymphatic leuchæmia in which 85% of white blood cells were small lymphocytes.

It is possible that many of the cases previously reported as acute lymphatic leuchæmia were instances of acute myeloid leuchæmia in which myeloblasts were not recognized as such, but were considered to be large lymphocytes or lymphoblasts. Supravital staining is perhaps the most reliable method of differentiating myeloblasts and lymphoblasts and is particularly efficacious in confirming a diagnosis of acute myeloid leuchæmia.

Summary.

1. The differentiation of various large mononuclear cells encountered in routine hæmatology is more definite when an examination of stained fixed films is supplemented by the supravital method of staining.

2. The technique of the supravital method is described.

3. A case of infectious mononucleosis is reported in which a detailed blood examination, including supravital staining, was made, and the morbid histology of a swollen axillary lymphatic gland was

studied. The large mononuclear cells in the circulating blood did not react to the peroxidase test and with supravital staining showed a rosette of neutral red granules in the indentation of the nucleus. Similar cells were present in lymphatic gland smears. Microscopically a lymphatic gland was seen to contain swollen endothelium of lymph sinuses and many free and fixed large mononuclear cells in the substance of the gland. Arneth's index had a shift to the left.

4. A case of acute myeloid leuchæmia is reported. There were 2% polymorphonuclear leucocytes and the majority of the cells comprised large mononuclears which did not react to the oxidase test, and which when examined by the supravital method were identified as myeloblasts and immature myelocytes.

5. A case of acute lymphatic leuchæmia is reported. The predominating cell in the blood picture was the small lymphocyte. There were 5% lymphoblasts which with supravital staining manifested the characteristic clumping of mitochondria.

6. Previously reported cases of infectious mononucleosis in Australia, England and America are cited. The clinical characteristics of the disease are described and the nature and origin of the predominating large mononuclear cell are discussed. It is concluded that the cell is identical with McJunkin's lymphendotheliocyte and is formed by a proliferation of reticulo-endothelium of lymphatic glands and spleen.

7. The difficulty of arriving at a positive diagnosis of acute myeloid leuchæmia is stressed and the value of supravital staining in helping to establish such a diagnosis is made evident.

8. The predominating cell in the case of acute lymphatic leuchæmia was the small lymphocyte. The conception that the large lymphocyte characterizes this disease is probably based on wrongly diagnosed cases of acute myeloid leuchæmia.

Acknowledgement.

My thanks are due to Dr. H. Laurie and Dr. J. P. Major for permission to report the cases, and to Dr. A. M. Hill, Dr. C. Barbour and Dr. A. G. Mancy for the clinical notes. I am also indebted to Mr. Doutch who constructed the microscope incubator for me.

References.

(1) F. R. Sabin: "Studies of Human Blood Cells," *Bulletin of the Johns Hopkins Hospital*, September, 1923, page 277.
(2) R. S. Cunningham, F. R. Sabin and C. H. Doan: "The Development of Leucocytes, Lymphocytes and Monocytes from a Specific Stem-Cell in Adult Tissues," *Contributions to Embryology*, 19—, Volume XVI, page 229.
(3) T. S. P. Strangeways and R. S. Canti: "Dark-Ground Illumination of Tissue Cells Cultivated 'In Vitro'," *The British Medical Journal*, July 24, 1926, page 155.
(4) F. A. McJunkin: "The Large Mononuclear Cell and the Transitional Leucocyte of Human Blood," *The Journal of Laboratory and Clinical Medicine*, October, 1926, page 71.
(5) Otto Naegeli: "*Blutkrankheiten und Blutdiagnostik*," Leipzig, 1912, quoted from "Oxford Medicine," page 709.
(6) A. Piney: "Recent Advances in Hæmatology," page 21.
(7) A. Breinl, H. Priestley and J. W. Fielding: "On the Occurrence and Pathology of Endemic Glandular Fever, a Specific Fever Occurring in the Mossman District of North Queensland," THE MEDICAL JOURNAL OF AUSTRALIA, October 24, 1914, page 391.
(8) J. Gordon Hislop: "Infectious Mononucleosis or Glandular Fever," THE MEDICAL JOURNAL OF AUSTRALIA, November 7, 1925, page 557.
(9) Walton Smith: "Infectious Mononucleosis," THE MEDICAL JOURNAL OF AUSTRALIA, April 10, 1926, page 407.
(10) H. Letherby Tidy and E. C. Daniel: "Glandular Fever and Infective Mononucleosis," *The Lancet*, July 7, 1923, page 9.
(11) T. P. Sprunt and F. A. Evans: "Infectious Mononucleosis," *Bulletin of the Johns Hopkins Hospital*, November, 1920, page 410.
(12) W. A. Bloedorn and J. E. Houghton: "The Occurrence of Abnormal Leucocytes in the Blood in Acute Infections," *Archives of Internal Medicine*, March, 1921, page 315.
(13) —. Longcope: "Infectious Mononucleosis (Glandular Fever) with a Report of Ten Cases," *The American Journal of the Medical Sciences*, December, 1922, page 781.
(14) H. Downey and C. A. McKinlay: "Acute Lymphadenosis Compared with Acute Lymphatic Leukæmia," *Archives of Internal Medicine*, July, 1923, page 82.
(15) J. E. Cottrell: "Infectious Mononucleosis," *American Journal of the Medical Sciences*, April, 1927, page 472.
(16) F. G. D. Murray, R. A. Webb and M. B. R. Swann: "A Disease of Rabbits Characterised by a Large Mononuclear Leucocytosis Caused by a Hitherto Undescribed Bacillus, Bacterium Monocytogenes," *Journal of Pathology and Bacteriology*, 1926, Volume XXIX, page 407.
(17) L. J. Witts and R. A. Webb: "The Monocytes of the Rabbit in B. Monocytogenes Infection: A Study of Their Staining Reactions and Histogenesis," *The Journal of Pathology and Bacteriology*, 1927, Volume XXX, page 687.
(17) T. E. Green: "A Case of Acute Lymphatic Leuchæmia, Possibly Aleuchæmic," THE MEDICAL JOURNAL OF AUSTRALIA, July 30, 1927, page 158.

SYPHILIS AS A DIAGNOSTIC PITFALL.

By RUPERT A. WILLIS, M.D. (Melbourne),
Medical Superintendent, Austin Hospital for Chronic Diseases, Heidelberg, Victoria.

IT is almost an axiom that syphilis may imitate and must enter into the differential diagnosis of almost all other lesions. The object of this paper is to lay stress on this sometimes neglected axiom by describing some characteristic examples which illustrate how great a diagnostic pitfall syphilis may be.

The patients described have all come under my personal observation at the Austin Hospital during the past two years. Most of the patients had undergone competent investigation and seemingly final and definite diagnosis at the public metropolitan hospitals. This fact is recorded, not to suggest peculiar acumen on the part of the Austin Hospital staff, but to indicate that syphilis constitutes a diagnostic trap, not only for the inexperienced and unwary, but may elude even the most careful and competent clinician. The Austin Hospital is at a diagnostic advantage in that we are able to follow the progress of patients for months or years and it would be much to our discredit if in the course of time we did not discover errors of diagnosis in conditions we can study for long periods.

The intention of this paper is to make permanent record of a number of cases which have proved

highly instructive in this respect, and which I believe will be of general value and interest.

The patients described fall into two main groups, namely, (i) those admitted under the diagnosis of tuberculosis, (ii) those admitted under the diagnosis of some neoplastic condition.

Syphilis Diagnosed as Tuberculosis.

CASE I.—The patient, a single male, aged twenty-four, in June, 1928, had an attack of "influenza," followed a month later by hoarseness and then aphonia. A cough with some expectoration persisted thereafter, with loss of weight and strength. He attended a public hospital where a skiagram of the lungs was taken and a laryngoscopic examination carried out. He was then recommended for admission to the Austin Hospital as suffering from "pulmonary and laryngeal tuberculosis."

Examination on admission in September, 1928, disclosed prolongation of expiratory murmur with scattered *râles* over the upper lobes of both lungs. Laryngoscopic examination revealed definite swelling and hyperæmia of the epiglottis and arytenoid region, with some ragged ulceration of the left glosso-epiglottic fold, also some ulceration of the false vocal cords.

The sputum was fairly plentiful, but repeated examinations failed to reveal any tubercle bacilli. A skiagram of the chest showed enlarged hilus glands on both sides and some increase in the bronchial tree shadows in the lungs; but there was no evidence of any focal pulmonary lesion. The Wassermann reaction was found to be present. The patient was given a course of "Novarsenobillon" injections and mercury by mouth.

Laryngoscopic examination at the end of December revealed definite improvement. The congestion and swelling were much less and there was visible scarring along the margins of the epiglottis; the cords were intact. The patient's general health was much improved. He was discharged in January, 1929, to attend the special clinic at the Melbourne Hospital.

The absence of bacteriological and X ray evidence of pulmonary tuberculosis, the result of the Wassermann test and the response to antisyphilitic treatment all leave little doubt that the lesion was syphilitic laryngitis, with probably a superimposed tracheo-bronchitis.

CASE II.—A young man, aged twenty-three, had had pneumonia and pleurisy in 1908 and again in 1918 since which a cough with abundant sputum had persisted. Several hæmoptyses occurred at the end of 1927 and early in 1928 he was admitted to a metropolitan public hospital where several further hæmoptyses occurred. At that time he also complained of some recent loss of strength and of some aching pain in the lower part of the back. He was admitted to the Austin Hospital in July, 1928, with a diagnosis of pulmonary tuberculosis.

On admission he appeared a well nourished man. There were scattered rhonchi and some expiratory prolongation in both lungs and impairment of the percussion note at the right base posteriorly. The spine manifested some kyphosis and impaired movement in the lower thoracic and upper lumbar regions.

Repeated examinations of the abundant sputum failed to reveal any tubercle bacilli. A skiagram of the lungs revealed no definite abnormality. A skiagram of the spine disclosed no evidence of any tuberculous lesion, but there were definite changes of the *spondylitis deformans* type. A skiagram of the lungs after intratracheal injection of "Lipiodol" revealed some bronchiectasis of the smaller peripheral bronchi of the lower lobes of both lungs, more pronounced on the left.

The result of the Wassermann test proved strongly positive and this was confirmed by a further test some weeks later. The patient admitted probable syphilitic infection in the latter part of 1927.

The treatment subsequently adopted consisted in administration of mercury by mouth, a course of "Novarsenobillon" and "Muthanol" injections and partial artificial collapse of both lungs. Compression of the right lung was discontinued, however, soon after its induction on account of adhesions preventing uniform collapse. Slight compression of the left lung has been maintained from November, 1928, to the present date (June).

The patient's general health remains good, but no striking therapeutic result can be claimed as yet.

The interest of the case in the present connexion lies in the relationship of the syphilitic infection to the lesions present. Pulmonary tuberculosis can be excluded on the bacteriological and skiagraphic findings. The bronchiectatic changes no doubt originated in the repeated respiratory infections recorded in the history; but it seems not unlikely that the superimposed syphilitic factor may have contributed to their recent development, especially as severe and repeated hæmoptysis occurred subsequent to the presumable date of venereal infection. That backache was also first noticed at this time may be taken to suggest a possible syphilitic element in the spondylitis.

CASE III.—A married woman, aged fifty-three, gave a history that in 1921 she had had pleurisy, but no pulmonary symptoms since. In 1923 she developed a painful stiff neck and after some weeks an "abscess" broke into the pharynx. The condition was diagnosed by a country practitioner as tuberculous caries of the third cervical vertebra with retropharyngeal abscess and was treated by immobilization in bed for three years. Discharge into the pharynx continued for many months, but recovery finally occurred, leaving a painless but rigid neck with great limitation of flexion, extension and rotation. In 1926 she developed a painful stiff elbow regarded as tuberculous arthritis and treated in a plaster of Paris mould. An ulcer developed over the olecranon and later healed up, leaving a painless elbow with almost full range of movement.

In April, 1927, an ulcer appeared on the palate and simultaneous ulceration on the side of the nose. These gradually extended and the patient was admitted to the Austin Hospital in October, 1927, with a diagnosis of "tuberculous ulceration of the palate and nose." Examination on admission disclosed an irregular ulceration with perforation of the anterior part of the palate and shallow ulceration with sinuous margins of the bridge and left side of the nose. Flexion, extension and rotation of the head were all greatly limited, but not painful. The elbow joint appeared normal except for a small scar over the olecranon. Otherwise the patient appeared in robust health. There were no signs of any pulmonary lesion.

A skiagram of the neck disclosed almost total collapse of the body of the third cervical vertebra and suggested an old carious lesion which had healed with considerable sclerosis. A skiagram of the elbow revealed no bony abnormality. The result of the Wassermann test was strongly positive.

The patient was given mercury and iodide by mouth and a course of eight weekly injections of "Novarsenobillon." By the completion of the latter the palatal and nasal ulceration had completely healed, leaving a puckered scar over the nose and a small pin point perforation of the palate. She was discharged in January, 1928, to attend her own doctor for further treatment.

She visited the Austin Hospital in May, 1929. The lesions had remained permanently healed and her general health was maintained. A skiagram was obtained of the cervical vertebræ and revealed no change since the previous one in October, 1927.

The interest of this case lies particularly in determining the pathology of each of the several lesions which had been present. The caries of the palate and the nasal ulceration were undoubtedly syphilitic and had apparently been regarded as tuberculous

by her private doctor only on account of previous bone lesions of an evidently tuberculous nature. It is very improbable that the patient ever had a tuberculous elbow joint, for the skiagram shows no bone changes and the joint function is perfect. It seems more likely that the original lesion had been a simple, possibly a syphilitic, synovitis with a pressure sore over the olecranon or alternatively that there may never have been any joint lesion and the sore over the olecranon may have arisen from a gummatous bursitis.

Finally, what was the nature of the spinal lesion? Neither clinically nor radiologically can tuberculosis be excluded. It must, however, be a rare event for an advanced tuberculous lesion of a cervical vertebra, complicated by a retropharyngeal cold abscess which has ruptured into the pharynx, to occur in a middle aged syphilitic patient and to heal up so thoroughly and permanently as in this case.

Is it more probable that the process may have been syphilitic caries of the spine, with ulceration into the pharynx?

CASE IV.—A Chinese gardener, aged forty-five, was admitted to a public hospital in January, 1928, with an attack of catarrhal jaundice. Whilst an inmate there, he complained of pain in the right iliac fossa and maintained an irregular pyrexia. Appendicectomy was performed, but the pain persisted. Some scoliosis was then noted and the spine was examined by X rays. He was then recommended for admission to the Austin Hospital with a diagnosis of "early tuberculosis of the first lumbar vertebra with some collapse and old tuberculous sacro-iliac arthritis."

Examination on admission in April, 1928, disclosed slight scoliosis with rigidity and pain on movement in the lumbar region of the spine. General examination was otherwise fruitless. Skiagrams revealed the following spinal lesions: (i) Partial destruction of the disc between the first and second lumbar vertebræ with considerable adjacent bony sclerosis and the formation of bridging spurs of new bone between the vertebral bodies on their left aspect; (ii) a carious lesion of the upper anterior corner of the body of the fifth lumbar vertebra and destruction of the adjacent disc with diminution of the intervertebral interval to a narrow slit; (iii) partial obliteration by dense bony ankylosis of the right sacro-iliac joint.

The result of the Wassermann test proved to be strongly positive, a finding confirmed some weeks later by a second test. The treatment adopted was recumbency in a plaster bed for three months, during which mercury and iodides were administered by mouth and eight weekly injections of "Novarsenobillon" were given.

In September, 1928, he was allowed up, antisyphilitic treatment being continued. A skiagram in November revealed no visible change since the previous photographs. In January, 1929, the patient was getting about actively and with comfort and was discharged.

In this case also tuberculous caries could not be dogmatically excluded. But the striking reparative tendency in the involved bones as evidenced by firm bony ankylosis of the sacro-iliac joint and the bridging spurs between the vertebræ, suggest at least a strong possibility that the whole process may have been syphilitic. Further favouring this view is the fact that, despite multiple, old standing, untreated, carious bone lesions, no cold abscesses ever developed.

CASE V.—Early in 1926 a male patient, aged thirty-eight, began to suffer from severe backache, chiefly in the right lumbar region. After some weeks spent in bed, a swelling developed in the right loin and was twice aspirated by his doctor. Soon after this he had an attack of "pleurisy" on the left side. Four months later he was allowed up and was soon able to return to work.

He remained well until July, 1928, when the right lumbar swelling reappeared. Aspiration was performed several times by his doctor, but secondary infection of the lesion evidently occurred, for he shortly after became ill with fever and repeated sweats and was admitted to a public hospital. Several further aspirations were done there, but the abscess was eventually incised and after some weeks of free discharge it slowly healed up. He was then recommended for admission to the Austin Hospital with a diagnosis of spinal tuberculosis with lumbar abscess and he was admitted in October, 1928.

Examination disclosed slight dorsal angulation of the spine at the twelfth thoracic level, but no pain or tenderness. Movements of the spine were definitely limited in this region. A healed right lumbar scar was present. Clinical examination was otherwise fruitless, save for a slight systolic cardiac murmur most pronounced at the base of the heart; his general health appeared excellent.

A skiagram revealed no abnormality of the lungs. Skiagrams of the spine disclosed complete fusion of the twelfth thoracic and first lumbar vertebral bodies into a solid cylinder of bone of normal texture and density, but with apparent subperiosteal thickening of the sides of the vertebræ, which were thus perceptibly expanded in transverse diameter.

The result of the Wassermann test proved strongly positive. The patient admitted venereal infection fifteen years before. The treatment adopted consisted of two months' recumbency on a plaster bed, during which a full course of "Novarsenobillon" and "Muthanol" injections was given and mercury was administered by mouth.

In February, 1929, a tender red swelling appeared over the middle of the shaft of the right tibia. A skiagram revealed a well defined area of bone destruction about 1·5 centimetres in diameter with no sign of any sequestrum. The swelling was incised and pus evacuated, containing *Staphylococcus aureus*. A skiagram a few weeks later showed reduction in size of the necrosed area. It was observed in both skiagrams that the whole shaft of the tibia was the seat of chronic periostitis with thickening of the bone by subperiosteal deposition. There was a characteristic appearance of "double outline" of compact bone.

In April the patient was actively up and about and he was discharged in May to attend an out-patient clinic at a public hospital.

The skiagraphic findings in both the vertebræ and tibia, considered with the proven existence of syphilis, leave little room for doubt that the whole process was of syphilitic nature. There are several points of interest. The lumbar cold abscess in 1926 and again in 1928 was presumably the product of gummatous degeneration and quite analogous to a tuberculous cold abscess. It became infected and then after drainage it promptly healed up. This is unlike an old standing tuberculous abscess with secondary infection. The local osteomyelitis of the tibia suggests an infected gumma, but it seems unlikely that a gumma would develope during active antisyphilitic treatment. A more likely diagnosis is that the lesion was of the nature of a chronic Brodie's abscess, perhaps of considerable duration and perhaps arising in an originally gummatous area in a bone evidently the seat of not recent syphilitic changes. The chronic periostitis of the tibia was too extensive and uniform to have been due to the existence of a chronic abscess.

Syphilis Diagnosed as Neoplastic Disease.

CASE I.—A widow, aged fifty-seven, had an illness which dated from 1914, when she first began to suffer with severe attacks of epigastric pain and vomiting. These attacks were of several days' duration and were separated by periods of two or three weeks of complete freedom from symptoms.

In 1916, the attacks becoming worse, with much loss of weight, she attended a metropolitan public hospital and underwent laparotomy. The hospital records of this operation are that perigastric and pericolonic adhesions were discovered, but no other organic lesion of any abdominal viscus. The adhesions were divided and the patient discharged three weeks later feeling well.

The attacks of pain and vomiting persisted, however, and in 1919 she was admitted to the Austin Hospital with a diagnosis of "gastric carcinoma." After admission the attacks continued and the patient became weaker and lost weight. For several years she remained in bed and was regarded as suffering from a slowly progressive malignant disease awaiting the inevitable end. She developed flexor contractures of the knees and lost sphincter control which had been imperfect for some years.

In 1926 the medical officer evidently suspected an error of diagnosis and the following facts are recorded in the history. Examination of the abdomen disclosed cutaneous hyperæsthesia with some general muscular rigidity. No definite mass could be palpated. The dorsal spine was tender to palpation. The knee jerks were absent, the plantar reflexes doubtfully extensor in type and the pupil reflexes normal. The Wassermann test with both blood and cerebro-spinal fluid gave no reaction. X ray examination after an opaque meal revealed stenosis of the distal end of the stomach which was reduced to a very narrow channel for about five centimetres (two inches) proximal to the pylorus, suggesting in the opinion of the radiologist a neoplasm rather than a chronic ulcer. Thus the original diagnosis of carcinoma seemed to be confirmed. It was thought that the absent knee jerks were due to the flexor contractures of the knees. In July, 1927, her general health remaining fairly good and the gastric symptoms becoming less severe, further reinvestigations were made with the following results. Neurological examination revealed absence of all deep reflexes and of the plantar reflex; patchy anæsthesia of the lower limbs; inability to recognize the shape of objects by touch; ataxia to pointing tests; and Argyll-Robertson pupils. Ophthalmoscopic examination revealed normal fundi. X ray examination still revealed the same gross filling defect of the distal end of the stomach. A fractional test meal gave acid curves of high normal type, the maxima being free acidity 64 and total acidity 82, reached two hours after the meal. The Wassermann test to the blood gave no reaction. During the last two years the patient's condition has remained largely unchanged, except that the gastric attacks are now infrequent and much less severe than formerly and her general health has improved.

In this case the final neurological findings establish the diagnosis of *tabes dorsalis*, despite the results of the Wassermann tests. The nature of the gastric lesion gives food for speculation. The duration, progress and chemical findings serve to exclude carcinoma.

Three possibilities remain, namely, (i) the lesion may be chronic gastric ulcer, (ii) the attacks strongly suggest tabetic crises and the radiological findings may conceivably be explained as due to distortion of the stomach by the perigastric adhesions which were first observed at the laparotomy in 1916, (iii) the whole condition, including the perigastric adhesions, may have been due to gastric syphilis. Of these possibilities the last seems the most likely, though gastric crises may also have been coexistent.

CASE II.—A married woman, aged thirty-nine years, in 1925 first began to suffer with aching pain in the limbs. This was severe for three months, then somewhat improved.

In March, 1928, a swelling appeared at the centre of the left clavicle and soon afterwards both knees became swollen and painful. The swelling on the clavicle increased and then ulcerated. She attended a public hospital and the diagnosis was made of "multiple myelomata of the clavicle, sacrum and long bones."

On admission to the Austin Hospital in October, 1928, examination disclosed the following abnormalities. At the junction of the inner and middle thirds of the left clavicle was a firm, smooth swelling the size of a hen's egg, surmounted by an ulcerated area with a sloughing base. The left knee appeared red and swollen and was painful on movement, but not tender. The swelling was chiefly around the upper end of the tibia. There were several pigmented scars on the outer aspect of the middle of the right leg. General examination was otherwise without result.

Skiagrams revealed almost total destruction of the inner third of the left clavicle, much irregular destruction of the head and upper third of the left humerus, with apparently an old united spontaneous fracture just below the surgical neck, rarefaction and partial destruction of the coracoid process, acromion and scapular spine on the right side, slight patchy bone absorption of the upper third of the right humerus, irregular rarefied areas in the medial condyle of the left tibia and a similar lesion in the left upper part of the body of the fourth lumbar vertebra. Skiagrams of other parts of the skeleton including the skull and of the lungs were normal.

The result of the Wassermann test proved strongly positive.

The patient was given a full course of "Novarsenobillon" and "Muthanol" injections and mercury and iodides by mouth.

In January, 1929, the pains in the limbs and the condition of the left knee had greatly improved and skiagrams suggested decided repair in the involved bones, especially the left humerus. The patient was discharged in good general health to attend as an out-patient at a public hospital.

In April, 1929, she revisited the Austin Hospital. The mass over the clavicle had largely disappeared, leaving a shallow ulcer in the floor of which an exposed area of clavicle was visible. Skiagrams revealed evidence of the formation of a new shaft from the involucrum of the clavicle and the other bone lesions all showed signs of progressive repair.

The result of the Wassermann test was still strongly positive.

It is certain that the lesion in this case was a widespread gummatous caries of various bones. The skiagraphic appearances were not those of myelomatosis and the reparative tendency of the diseased areas, especially after the institution of antisyphilitic measures, was a striking feature. Such a condition must be of some rarity.

CASE III.—A male, aged sixty-three, first noticed a small painless lump in July, 1928, at the junction of the penis and scrotum. This rapidly grew in size and ulcerated. The patient attended a public hospital, where the condition was regarded as an "inoperable epithelioma of the scrotum."

Examination on admission to the Austin Hospital in February, 1929, revealed extensive nodular ulceration involving most of the scrotum and the base of the penis. The margins of the ulcer were exuberant, everted and indurated. The inguinal glands were palpable on both sides, but not enlarged. There was no thickening of either *vas deferens*. The appearance of the lesion was that of a typical epitheliomatous ulcer.

On February 12 amputation of the penis and scrotum was performed as a palliative measure. Four different and apparently representative samples of tissue were

removed from the amputated mass for histological verification of the diagnosis. All four sections manifested the same features, namely, much diffuse fibrosis of the scrotal tissues, great accumulation of lymphocytes and endothelial leucocytes, occasional giant cells and conspicuous endarteritis of all arterioles. There was no evidence of any malignant invasion.

The result of the Wassermann test proved strongly positive.

Antisyphilitic treatment was commenced and in April, the wound being soundly healed, the patient was discharged in good health to attend as an out-patient at a public hospital. At the present time (June) he still remains well.

In this case so obvious did the clinical diagnosis appear that the histological findings came as a great surprise. Unfortunately the remainder of the specimen had been thrown out by the laboratory assistant after removal of the pieces for section. We are therefore not in a position to assert that the whole lesion was syphilitic. There may have been malignant change in other parts of the lesion and possible recurrence must be watched for.

The interesting point in the present connexion is that a "clinically obvious epithelioma" proved histologically to be, at least largely and perhaps entirely, a syphilitic ulcer.

CASE IV.—A widowed woman, aged fifty-seven, had had a mole near the inner canthus of the left eye since childhood. In 1922 it commenced to enlarge and ulcerate. Ulceration slowly extended and in February, 1927, she attended a public hospital, whence she was recommended to the Austin Hospital with a diagnosis of "rodent ulcer of the face and orbit."

On admission in September, 1927, she had a crateriform ulcer of the medial canthus, extending for about one centimetre along the medial wall of the orbit and shallow ulceration with sinuous thickened margins of the adjacent parts of the nose and supraorbital region. General examination was otherwise without result.

The result of the Wassermann test was positive. Her family history was also suggestive; her only child had died at three months of "convulsions" and she had had one other miscarriage and a sister had died of a ruptured aneurysm.

A sample for histological examination was excised from the supraorbital part of the ulcer margin. It revealed typical basal-celled carcinoma. Nevertheless, the appearance of parts of the ulcer decided us to try the effect of antisyphilitic treatment. A course of "Novarsenobillon" injections was given and mercury and iodides by mouth.

Very definite improvement occurred. Much of the superficial parts of the ulcer healed, including the area from which the piece for section had been removed. The deep crater of the ulcer also granulated well and became much shallower. The patient was discharged in November, 1927, greatly improved, to attend as an out-patient at a public hospital where antisyphilitic treatment was continued.

The interest of this case is that a proven rodent ulcer was evidently engrafted on a predominant syphilitic basis and that therapeutic elimination of the gummatous element in the lesion resulted in pronounced healing and thus reduced what appeared to be an extensive and ineradicable malignant ulcer to a relatively small and localized lesion, possibly amenable to later treatment by diathermy or radium.

CASE V.—A married woman, aged fifty-five, in 1916 began to suffer from persistent backache and pains in the legs, variously diagnosed as "sciatica," "lumbago" and "rheumatism." These pains persisted on and off for about five years and then improved and she enjoyed two years' freedom.

In 1923 she first noticed some weakness of the lower limbs. This slowly increased and some anæsthesia also developed. On one occasion she burnt her foot at a fire, but felt nothing. Sphincter control was also lost.

Early in 1925 her spine was operated on at a public hospital. The hospital records are that laminectomy of the upper lumbar vertebræ was performed and two separate extrathecal tumours were discovered, one at the level of the first lumbar vertebra and another further caudally. The *cauda equina* had suffered compression. The masses were removed and were entered as "multiple extrathecal lipomas."

The paraplegia did not materially improve subsequent to the operation. The patient was nursed at home and developed large "pressure sores" of the buttocks and perineum. She was admitted to the Austin Hospital in June, 1927.

Examination on admission revealed almost total flaccid paralysis of the lower limbs, with absent reflexes and definite impairment, though not complete abolition of sensation. Anæsthesia was absolute over the buttocks and perineum. Sphincter control was absent. There were no other neurological abnormalities. There were several large ulcers in the gluteal and perineal regions. The largest of these was very deep, extending far up into one ischio-rectal fossa. Its margins were undermined and its base sloughy.

The result of the Wassermann test was returned as "feeble partial." The ulcers did not look like ordinary bed sores and it was decided to try antisyphilitic treatment. Mercury and iodide were given by mouth and a course of "Novarsenobillon" injections was given during September and October, 1927. The ulcers began to granulate well and became perceptibly smaller. There was also definite improvement in sensation and the movement of the feet. The patient also complained of intermittent shooting pains in the left leg.

During December, 1927, and January, 1928, treatment was continued, a second course of "Novarsenobillon" injections being given. In March the ulcers had healed and there was definite improvement of sensation and of movement of the lower limbs. The knees could be flexed a little. The Wassermann test at this time gave no reaction. In June, 1928, the ulcers had extended a little again. Treatment was therefore reinstituted and a further course of injections was given during July and August. The ulcers commenced to heal again.

Thereafter mercury and iodide were continued by mouth and the present condition of the patient is that the ulcers are completely healed and movement and sensation are much improved in the lower limbs. There has been no return of sphincteric control.

The chief interest of this case is that an almost total paraplegia of several years' duration has very materially improved under antisyphilitic treatment and that the supposed "bedsores" accompanying the paraplegia have healed. The prompt reparative response in the ulcers on commencing treatment and the cessation of healing on one occasion when active treatment had been discontinued, strongly suggest a definite gummatous element in the ulcers. "Bedsores" they may have been, too, but syphilitic bedsores. The therapeutic elimination of the syphilitic factor permitted sound healing of long standing sloughing wounds several inches in diameter.

The neurological improvement also can only mean that the spinal lesion was at least in part of syphilitic origin. "Multiple extrathecal lipomata" must be a pathological rarity; but one can now only speculate as to what kind of syphilitic lesion

ILLUSTRATIONS TO THE ARTICLE BY JOHN A. McLEAN.

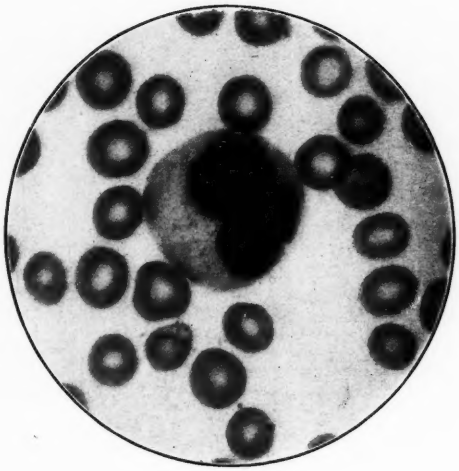


FIGURE II.

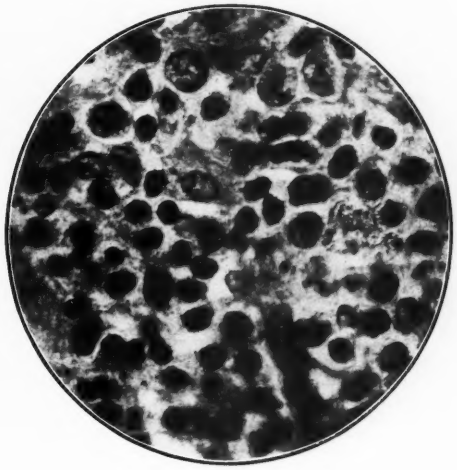


FIGURE IV.

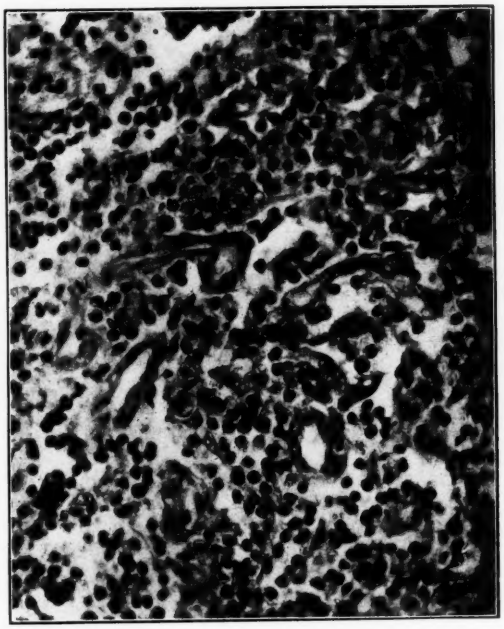


FIGURE V.

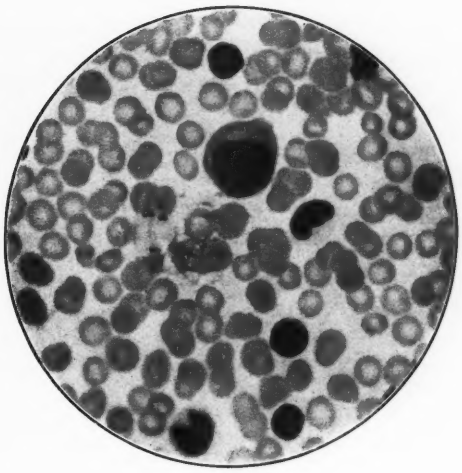


FIGURE VI.

UNIV

ILLUSTRATIONS TO DR. J. A. McLEAN'S ARTICLE.

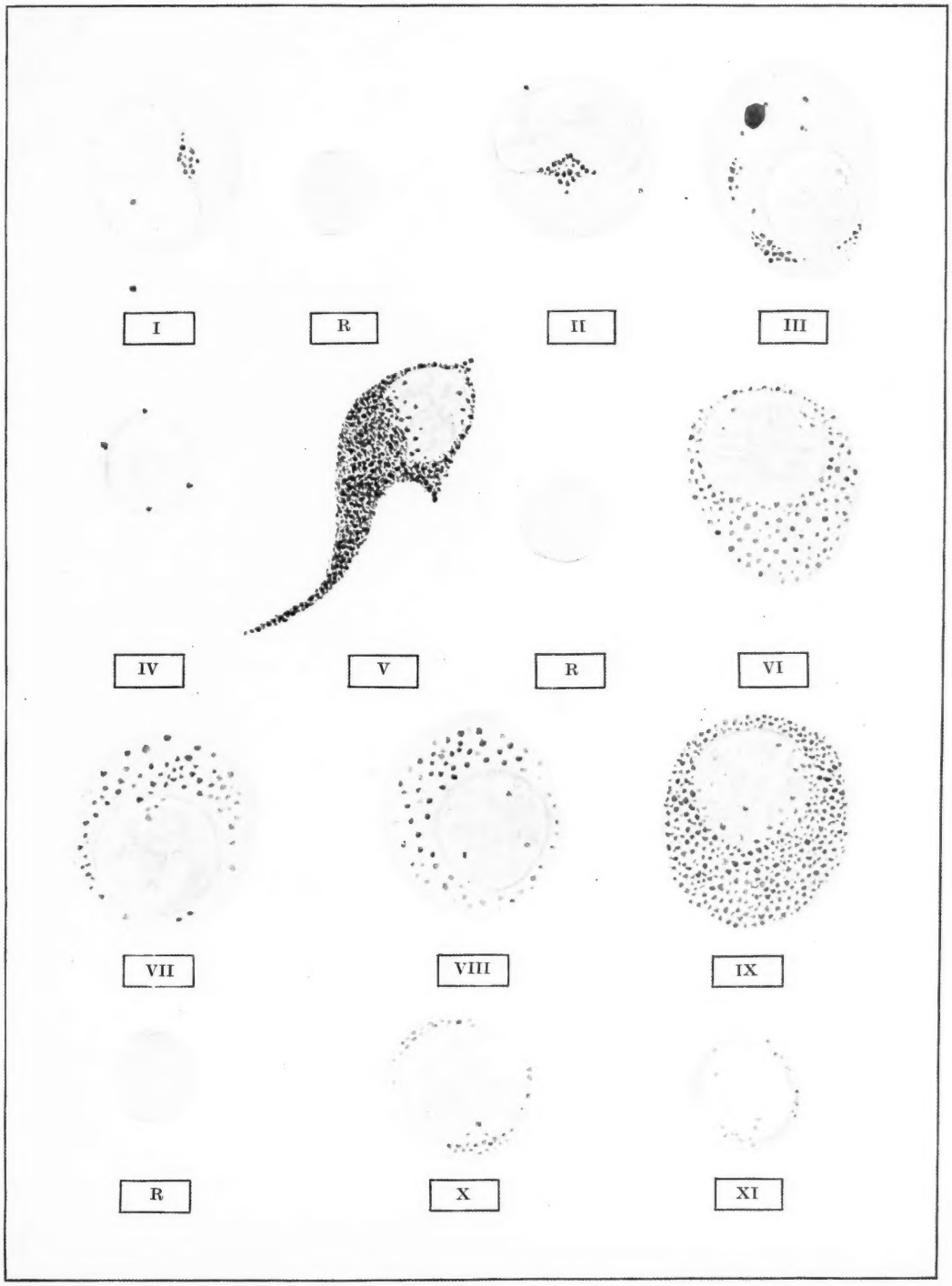


FIGURE III.

may have been mingled with or have resembled the fatty tumours. A striking point about the paraplegia was its decided improvement after being almost total for such a long period.

CASE VI.—A male, aged sixty-four, early in 1925 began to suffer from slight dysphagia and dyspnœa on exertion. He consulted a throat specialist who arranged his admission to a public hospital, where a tracheotomy was performed. Both the dysphagia and dyspnœa were relieved and he remained quite well until June, 1927, when extreme dysphagia quite rapidly developed, until the patient could not even swallow fluids and food taken came through the tracheotomy tube and seriously obstructed respiration. He was urgently readmitted to hospital and gastrostomy was performed. Deep X ray therapy to the neck was given later.

He was thereafter recommended to the Austin Hospital as a sufferer from "epithelioma of the postcricoid region with œsophageal obstruction" and was admitted in July, 1927.

General examination revealed an apparently healthy man with permanent gastrostomy and tracheotomy openings. There were no glandular enlargements or other abnormalities in the cervical region and ordinary clinical examination revealed no abnormality. Laryngoscopic examination was obscured by mucus collected in the pharynx, but it was observed that the epiglottis was swollen and rolled into a cylindrical form and the left arytenoid region was swollen and infiltrated. The visiting laryngologist was of the opinion that the lesion was a carcinoma of the larynx with postcricoid spread. The radiologist's report on the screen examination of a swallowed bolus, was that the "bolus was obstructed at the upper part of the œsophagus, which appeared very irregular and suggested carcinoma." The barium gruel was all returned *viâ* the tracheotomy tube.

The diagnosis was regarded as finalized and a second dose of X ray treatment was given in August.

In October, 1927, the result of the Wassermann test was strongly positive. Antisyphilitic treatment was at once commenced and the patient remaining in excellent health and gaining weight, he was discharged in November to attend as an out-patient at a public hospital.

His subsequent history is of great interest. Antisyphilitic treatment was continued and by March, 1928, complete healing of the lesion had occurred. The *aditus laryngis* was totally obliterated, as was also the upper end of the œsophagus, the pharynx terminating caudally as a blind conical pocket, lined throughout by intact mucous membrane. Although the risks were emphasized to him, the patient pleaded for surgical reconstruction of his œsophagus. This was finally attempted about June, 1928. The complete occlusion of both laryngeal and œsophageal orifices was confirmed, the upper end of the œsophagus being obliterated for about two centimetres and then normal. An attempt was made to free the upper end of the œsophagus as a preliminary to a subsequent second stage reconstruction, but the patient died two days after the operation.

The syphilitic nature of this condition, first suspected on account of its long duration without any glandular metastases or cachectic changes, was completely demonstrated by the remarkable effect of antisyphilitic treatment in producing complete healing of a lesion which had totally disorganized the lower part of the pharynx, the commencement of the œsophagus and the larynx. The anatomical result of healing was unique.

Summary and Conclusion.

Eleven cases are detailed in which syphilitic lesions eluded competent investigation, and a diagnosis of either neoplasm or tuberculosis was made. The accompanying tables summarize the series.

TABLE A.

Case.	Diagnosis on Admission.	Final Diagnosis and Result.
1. M. 24 ..	Pulmonary and laryngeal tuberculosis.	Syphilitic laryngitis. Cured.
2. M. 23 ..	Pulmonary tuberculosis.	Bronchiectasis with probable syphilitic element. Improved.
3. F. 53 ..	Cervical spinal tuberculosis with retropharyngeal abscess. Tuberculous ulceration of palate and nose.	Cervical spinal syphilis. Syphilitic ulceration of palate and nose. Cured. Lumbar spinal and sacro-iliac syphilis. Probably cured.
4. M. 45 ..	Lumbar spinal and sacro-iliac tuberculosis.	Dorso-lumbar spinal syphilis.
5. M. 38 ..	Dorso-lumbar spinal tuberculosis with lumbar cold abscess.	Syphilitic periostitis of long bones. Probably cured.

TABLE B.

Case.	Diagnosis on Admission.	Final Diagnosis and Result.
1. F. 57 ..	Carcinoma of stomach.	*Tabes dorsalis*; gastric syphilis. Progress of tabetic changes, but gastric symptoms improved.
2. F. 39 ..	Multiple myelomata.	Multiple gummata of bone. Much improved.
3. M. 63 ..	Carcinoma of scrotum.	Gummatous ulceration; malignant disease possible, but very doubtful. Much improved, probably cured.
4. F. 57 ..	Rodent ulcer of orbit and face.	Relatively small basal-celled carcinoma on predominant gummatous ulceration. Much improved.
5. F. 55 ..	Multiple extra-thecal lipomata; paraplegia; bedsores.	Syphilomata of spinal canal; gummatous ulceration of the buttocks. Much improved.
6. M. 64 ..	Carcinoma of postcricoid region and larynx.	Pharyngeal and laryngeal syphilis. Cured. Subsequent death following operation.

In the majority of the cases a routine Wassermann test was the beginning of suspicion as to the accuracy of the diagnosis; confirmation of that suspicion being subsequently established by retrospective survey of the clinical history or by radiological or histological findings or by the therapeutic result.

The conclusion is, therefore, that a routine Wassermann test should be done in all cases in which a provisional or even a confident diagnosis of either tuberculosis or malignant disease has been made, especially if any feature of the case is anomalous or if bacteriological proof of tuberculosis on the one hand or histological proof of neoplasm on the other has not been definitely established.

Acknowledgement.

I am indebted to the members of the honorary staff of the Austin Hospital for their permission and advice in describing the above cases.

SOME OBSERVATIONS ON THE TONSIL.

By H. H. WOOLLARD, M.D., D.Sc.,
Elder Professor of Anatomy and Histology, Adelaide University,

AND

L. A. MCLEAN,
Medical Student, Adelaide University.

WHEN all the lymphoid tissue of the body is added together, it makes an organ system of very considerable dimensions. The literature which contains the investigations devoted to this system, is abundant. Despite these seeming advantages our ignorance of the structure and functions of this extensive organ system is profound.

Though anatomists have emphasized its subdivisions based on the different relations to adjacent tissues, no sufficient basis yet exists for suggesting that all parts of the system are not functionally equivalent. Its supposed defensive rôle seems to depend on the reticulo-endothelial elements in which the lymphocytes are enmeshed, rather than on the lymphocytes themselves. In fact the lymphocytes seem rather to invite bacterial invasion than to resist it. Their presence in degenerating tissues, in transplanted tissues and in association with new growths has suggested a part, perhaps humoral, in preventing the growth of other cells. Murphy's work has attributed to them the explanation of why transplanted tumours grow at early and not at later stages in the developing chick. The transplant fails to take when the lymphoid tissues develope. However, there seems little reason to assume that in autogenous growths, for instance, they play any such part. The greater abundance of the lymphoid tissue in the early period of growth and its retrogression at puberty would seem perhaps to be correlated with the evidence obtained from tissue culture—that lymphocytes are rich in trephones or growth-promoting substances. No evidence has so far been obtained from the growing organism that they actually do fulfil such a function during growth, except that of thymus feeding of tadpoles. This was said to have produced giant tadpoles—growth without differentiation. It has not been determined what elements in the thymus produced this result.

Histology has furnished abundant evidence that the cells in all lymphocytic accumulations are in a state of active multiplication. The number of circulating white cells in the blood had been studied by Sabin and her colleagues at the closest possible intervals for long periods and it appears that there is a daily rhythm. An afternoon rise occurs, irrespective of food or drink, which is due to the neutrophiles. In addition these show evidence of an hourly rhythm and of destruction in the blood stream. The lymphocytes exhibit a much more frequent rhythm, changing about every fifteen minutes. Their fluctuations are as from one to three, that is, the greatest number present in the blood of a normal individual may be at one count three times the smallest number present at another count. They form somewhere between 12% and 30% of the circulating white cells. Sabin remarks that she obtained no evidence that any number of lymphocytes dies out in the blood stream. On what this rhythm and constancy of the white cells of the blood depend we have no knowledge. Moreover, the relatively small number of these cells in the blood does not seem to explain the vast proliferation of cells that appears to be always going on in the lymphoid system. The general idea is that lymphocytes produced in the various glands are swept out in the lymphatic circulation from which they enter the blood. In the spleen they would enter the blood stream directly.

However, it is probable the mechanism is not so simple as this. Pseudoleuchæmia appears to differ from the usual variety only in that the circulating elements are practically unaltered. Otherwise the pathological changes are the same. No explanation has been found why the cells in the one case reach the blood stream and in the other do not.

There are three main anatomical subdivisions of the lymphoid system. The hæmolymph system includes the spleen and accessory spleens where present. Usually the hæmolymph glands are included in this system, but it is more probable that they are degenerated lymph glands which have lost their connexion with the lymphatic circulation and whose sinuses have become filled with red cells by diapedesis. This blood is no longer part of the vascular circulation. The characteristic of the hæmolymph system is the development of lymphoid accumulations in close relation with the blood vessels.

The lymphoglandular system includes the ordinary lymph glands and the lymphatic circulation. Here the lymphocytic accumulations are developed in relationship with the reticulo-endothelial elements of the lymphatic circulation. The lymphocytes produced in the germ centres are supposed to enter the lymphatic channels, to leave by the efferent vessels and enter the vascular stream finally. For proof this would need a greater knowledge of the flow and cellular content of the thoracic duct than we possess.

The third subdivision is the epithelio-lymphoid system. It includes all the smaller and larger accumulations of lymphoid elements found throughout the alimentary tract. Though generally stated that the lymphocytes produced in these accumulations also find their way into the lymph circulation and so ultimately into the blood stream, yet there is good reason to suppose that a very large proportion of them, if not all, pass through the overlying epithelium of the alimentary tract and undergo destruction on its surface.

Though there is no apparent morphological difference between the lymphocytes belonging to any of these three systems, yet there is a possibility that they are all not physiologically equivalent. We

have mentioned in the case of the epithelial system a different destination of the lymphocytes. In pathology there is some reason to suppose that it escapes the usual involvement of the leuchæmic process. This has been noted in mice (Dr. McCoy Hill, personal communication) and in Sternberg's description of the leuchæmic process its involvement is regarded as an unusual event. It might be of interest to determine if the reactions of these different parts of the lymphoid system to X rays and drugs differ.

The Tonsil.

An inspection of the entodermal accumulations of the epithelio-lymphoid system discloses two varieties, the solitary glands and agminated follicles. In the latter we might include not only the Peyer's patches and the appendix, but probably also the thymus, the tonsil, the pharyngeal and lingual accumulations. This cranial and caudal distribution of the larger accumulations of the epithelio-lymphoid system must have some special significance, though we are quite ignorant as to what it may be.

It is a question whether the thymus and the tonsil are merely examples of the cranial aggregations or whether one or both should be regarded as special organs. Most authors would include the tonsil in the epithelio-lymphoid system without any special qualification, but would place the thymus apart as possessing peculiar features. The validity of this separation of the thymus is not so convincing now that we know its reticulum is derived from the entoderm. It is therefore a structure in which lymphoid tissue is enmeshed in close apposition with the entoderm, the characteristic of the lymphoid tissue of the alimentary tract.

Since the work of Hammar the tonsil has been regarded as a special derivative of the second gill pouch. He states that the tonsil in man arises during the third month of intrauterine development as an evagination of the mucous membrane. Lymphocytes appear at the fourth month and follicles are present at birth. This evagination of the mucous membrane produces the tonsillar fossa which becomes more defined by the formation of the anterior and posterior pillars. The fossa becomes reduced later by the appearance of an elevation which, when flattened out, forms the *plica triangularis*. This takes no part in the formation of the tonsil in man according to Hammar. Epithelial papillæ invade the subjacent tissue and lymphoid accumulations appear. The formation of lymphocytes is accompanied by a large increase of the fixed connective tissue cells, the lymphocytes being probably produced locally. They only become abundant towards the close of fœtal life. von Grünwald has drawn attention to the epithelial changes in the tonsillar fossa. The entodermal cells become large and polygonal in shape with small nuclei, invade the subjacent tissue and become intimately mixed with the mesodermal cells. The basement membrane is absent over these invading papillæ. Two parts can be distinguished in the developing tonsil, a glandular portion in the region of the posterior pillar and an epithelial part which belongs essentially to the posterior surface of the *plica triangularis*. In this latter only lymphoid material accumulates and it appears first in the region of the invading epithelial columns. von Grünwald believes the tonsil to be a special organ in every way homologous to the thymus.

Kingsbury and Turner deny the branchiomeric equivalence of the tonsil and thymus. They regard the tonsillar fossa for the most part as a new formation corresponding to the second arch only in its most ventral portion. In addition they draw attention to the absence of the tonsil in some animals, such as rodents. For these reasons they oppose the idea that the tonsil is a special derivative of the second arch. They suggest that the tonsil arises as the result of an interaction between the entoderm of the tonsillar fossa and the subjacent mesoderm.

The introduction of experimental methods has now begotten the habit of regarding organ formation as the result of dynamic factors which may be resident in the *Anlage* itself or be dependent on the interaction of adjacent tissues. In the mouth, for instance, it may be supposed that ordinarily the interaction of epithelium and mesoderm produces fibrous tissue, but in other regions, as the tonsil, for instance, produces a lymphocytic accumulation. Though many have supposed that the lymphocytes wander into these accumulations, being produced elsewhere, yet the evidence grows stronger that they are produced locally and in any case some particular factor must be responsible for their aggregation in particular places. This factor appears to reside in the entodermal cells.

The work of Harrison on the production of the balancer in amblystoma shows that this organ owes its origin to the effect of the ectoderm on the subjacent mesoderm. Here the ectodermal cells show differentiation into two layers, an outer which produces a mucinous secretion, and an inner which brings about evagination of the mesoderm and the formation of a basement membrane. By experimental methods a similar interaction between the enamel organ and the formation of the mesodermal elements of the tooth has been established.

Mention has already been made of the observations of von Grünwald in which the changes in the entoderm cells and their ingrowth appear to determine the formation of the lymphocytes and their accumulation. We have sectioned the tonsillar region in a large number of new-born fœtuses and also the larger tonsils of older subjects. In the new-born tonsillar fossa the amount of lymphoid tissue is small. This occupies the antero-inferior part, while the upper part is occupied by mucous glands. There are several features which indicate a relation between the epithelium and the production of the lymphoid accumulations. There is always between the two elements the most immediate contact. There is no intervening structure between them and where

lymphoid accumulation is greatest the same is the place where evidence of entodermal activity is found. This entodermal activity consists in the formation of several layers of large polygonal cells with an abundant clear cytoplasm and small nuclei. These are not separated by any basement membrane from the underlying lymphoid accumulations. There is the invasiveness of the entoderm. Columns of entodermal cells enter the subjacent mesoderm and induce lymphocytic accumulation about them. Subsequently the central cells break down and in this way the crypts are formed. These changes can be well seen in the microphotographs of the large tonsil of a girl aged six. Further, there are indications of degeneration in the nodes furthest from the surface, while active proliferation continues nearer to the epithelium. In the enlarged tonsil of early childhood and in the new-born the signs of activity in the overlying entodermal cells correspond exactly with the distribution of lymphoid tissue. Both the early development and the later stages suggest that the entodermal activity is a factor in the development of the tonsil. The changes in the subjacent mesoderm, together with what is known of the potentialities of mesenchyme cells, suggest local proliferation of lymphocytes. These observations are supported by the results

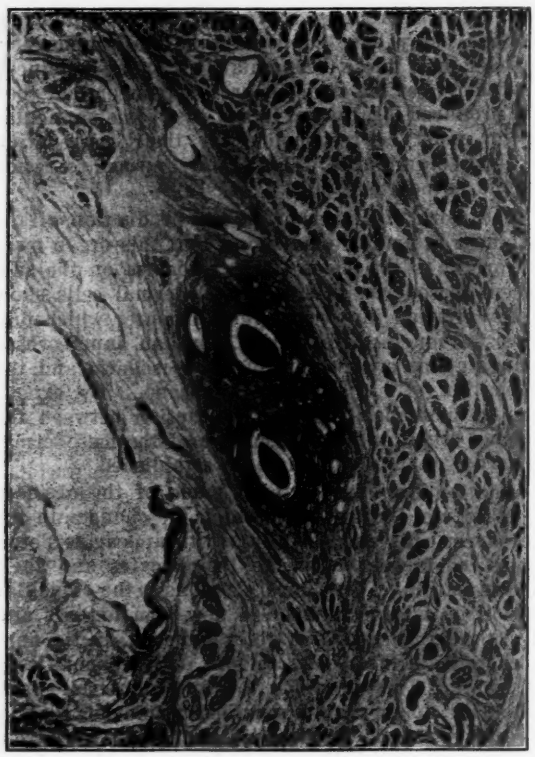


FIGURE I.

A Microphotograph of a Coronal Section of the Tonsillar Fossa in the New-Born. In the upper part of the fossa the glands are visible and below the lymphoid accumulation around the tonsillar crypts. × 20.

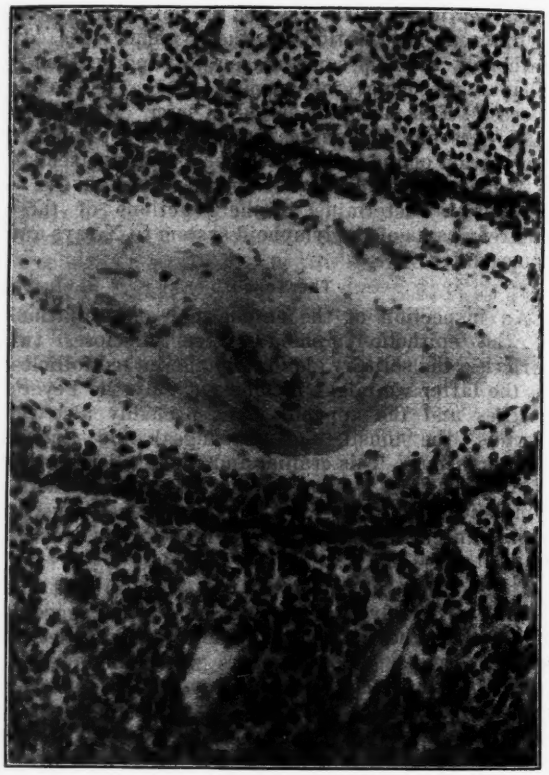


FIGURE II.

A High Power Microphotograph of the Crypt of a Tonsil in the New-Born Infant. The degenrating epithelium occupies the cavity of the crypt. The epithelium lining the crypt is thickened and active, the lymphocytes have accumulated in close relation with the epithelium. × 240.

obtained by experiments on the dependent differentiation of the balancer organ and tooth structure in certain amphibians. It is very probable that the thymus is formed by a similar interaction between entoderm and mesoderm. If there were such a condition as *status lymphaticus*, it would be hard to reconcile such with this notion of local differentiation of lymphoid tissue in the alimentary tract, but it appears from the recent review of Sternberg that there is no such condition. The cause of development of the tonsil here suggested is mainly of theoretical interest. The invasiveness of the entodermal cell columns admits of no modification of the usual methods of tonsillectomy.

In looking through our sections we kept in mind the vascular supply of the tonsil, for bleeding after tonsillectomy has been the subject of much discussion. In several new-born infants we injected the arteries and veins with a coloured celloidin mass, modifying the procedure by tying off different vessels. The celloidin mass allowed erosion of the tissues to be carried out by strong hydrochloric acid. The main supply of arterial blood comes by way of the facial artery. At the lower border of the mandible this artery divides into its submental and external facial branches, these being of approxi-

FIGURE III.

A Low Power Microphotograph of the Large Tonsil of a Girl Aged Six Years. The lymph nodes are abundant and show signs of degeneration at the places farther from the epithelium. The capsule separating the tonsil from the superior constrictor muscle is seen at the bottom. × 20.

mately the same size. The submental artery runs on the lateral surface of the mylohyoid muscle as far as the *symphysis menti*. From this artery branches proceed, medially to the body of the mandible, into the sublingual region. Some of these branches occasionally anastomose with the lingual. The branch from which the tonsil gets its supply, runs upwards between the styloglossus and internal pterygoid and pierces the superior constrictor. It gives off branches to the base of the tongue which anastomose with the *dorsalis linguæ*. It reaches the soft palate and perhaps the Eustachian tube. The main artery of the tonsil enters near its lingual base in older subjects and about the middle of the tonsillar fossa in younger subjects. At the same point the vein emerges and nerves are found. This region may be regarded as the hilum of the tonsil. Our observations lead us to minimize the many sources from which arterial blood is said to reach the tonsil, and to insist that the main supply is from the facial entering towards the base of the tonsillar fossa.

In the larger tonsil of the older subjects the sections reveal the very great vascularity of the organ. All through the lymphoid tissue are large, thin-walled veins filled with blood. Such a specimen was fixed and, the contained blood being used as a natural injection, the organ was cleared and photographed. Figure V was so obtained and it shows the abundance of vessels. The tonsillar mass is dark owing to the dense collection of blood vessels. Above they can be seen descending from the uvular region. Large peripheral channels are seen in the lower part and these gradually coalesce to enter the facial veins. The arrangement is such as would explain a post-operative hæmorrhage of venous origin from the base of the tonsil. A reference to Figure IV shows how such a thin-walled vein could be held open by adjacent connective tissue.

The relation of the lymphoid accumulation to surrounding structures was observed. The clearness of the capsule and its thickness can be seen by reference to Figure III. The capsule is of this nature everywhere on the external aspect of the tonsil. The separation from the muscle, the superior constrictor, is sharp except for slender septa which here and there enter the tonsil. There is no confusion with muscle as has been mentioned by some writers, nor have we observed any thickening of the capsule such as might be described as a suspensory ligament.

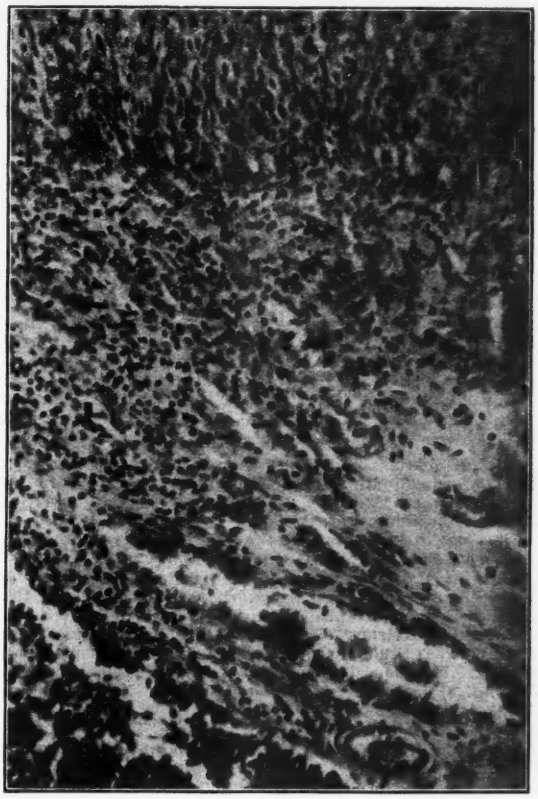


FIGURE IV.

A High Power Microphotograph of the Large Tonsil of a Girl Aged Six Years. At the top the many layers of active epithelium are visible. Below this an accumulation of lymphocytes is seen, while near the bottom of the photograph a large thin walled vein containing red blood corpuscles is cut across. × 250.

FIGURE V.

A Photograph of the Tonsil of a Girl Aged Six Years. The blood was used as a natural injection and the specimen cleared. The uvula is at the top and the tongue below. The central area appears dark because of the mass of blood vessels. The flow of vessels from the uvular region and the congregation of large vessels towards the lingual region can be seen. × 4.

Summary.

1. The entodermal origin of such lymphoid organs as the tonsil is suggested.

2. The large tonsil of childhood is an extremely vascular organ full of large venous channels which congregate and coalesce towards the lingual base of the tonsil.

3. The capsule which separates the tonsil from the muscles externally, is thin but definite.

Bibliography.

1. E. A. Adams: "An Experimental Study of the Development of the Mouth in the Amphibian Embryo," *Journal of Experimental Zoology*, Volume XL, 1924, page 311.

2. L. von Grünwald: "*Ein Beitrag zur Enstehung und Bedeutung der Gaumenmandeln*," 1919, *Anatomischer Anzeiger, Band* XXXVII, *Seite* 150.

3. J. A. Hammar: "*Studien über die Entwicklung des Vorderdarms und einiger angrenzenden Organe*," 1903, *Archiv für mikroskopische Anatomie, Band* LXI, *Seite* 404.

4. R. G. Harrison: "The Development of the Balancer in Amblystoma Studied by the Method of Transplantation and in Relation to the Connective Tissue Problem," *Journal of Experimental Zoology*, Volume XLI, 1924, page 349.

5. B. F. Kingsbury and W. M. Rogers: "The Development of the Palatine Tonsil," *The American Journal of Anatomy*, Volume XXXIX, 1926, page 379.

6. J. B. Murphy: "The Lymphocyte in Resistance to Tissue Grafting, Malignant Disease and Tuberculous Infection," "Monographs of the Rockefeller Institute for Medical Research," 1926, Number 21.

7. C. Sternberg: "*Blut, Knochenmark, Lymphnoten, Milz*," in "*Handbuch der speziellen pathologischen Anatomie und Histologie*," Erster Teil: *Blut, Lymphnoten*, Berlin, 1926.

Reports of Cases.

SUBMUCOUS LIPOMA OF THE HYPOPHARYNGEAL WALL.

By G. A. D. McARTHUR, M.D., B.S. (Melbourne),
Honorary Ear, Nose and Throat Surgeon, Victorian Eye and Ear Hospital, Melbourne.

OWING to the rarity with which submucous lipoma occurs in the pharynx and because of some difficulty in diagnosis and treatment, the following case is thought worthy of being placed on record.

Case History.

J.S., a male, aged thirty-seven years, was first seen on January 13, 1926, when he complained that during the preceding two years the tone of his voice had gradually altered, so that at the time of examination he was no longer able to sing. He stated that there was no difficulty with breathing or swallowing.

When he spoke, the peculiar quality of his voice was at once apparent. It had a full, soft intonation, somewhat similar to that of a person with a peritonsillar abscess. On depression of the tongue, a round, pale, yellowish-pink tumour, with several blood vessels coursing over its surface, and about 2·5 centimetres (one inch) in diameter, was seen occupying the valecula. On palpation the tumour was smooth and elastic and appeared to occupy a considerable portion of the pharynx. It was moderately movable and while its site of attachment could not be definitely ascertained, it appeared to be attached to the anterior surface of the epiglottis, the tip of which could be seen posteriorly and to the left. There were no enlarged cervical glands.

A diagnosis was made of cyst of the epiglottis and the patient was advised to have the tumour removed by operation. Owing to business reasons this had to be postponed, but the patient returned a year later. During this period no new symptoms had arisen, but the tumour appeared to have increased slightly in size.

A pair of infected tonsils were first removed and fourteen days later, when the fauces had healed, an attack was made on the "cyst." After its surface had been swabbed with a 10% solution of cocaine, a wide bore needle, attached to a syringe, was inserted into the tumour, but no fluid was obtained. A knife was then plunged into its substance, with a similar result.

T ihs led to a review of the diagnosis and it was decided that the tumour was probably a submucous lipoma. The patient was then anæsthetized and anæsthesia maintained by intratracheal administration of ether, the tumour being pushed to one side for insertion of the catheter.

An excellent exposure of the hypopharynx was then obtained by means of Killian's suspension laryngoscope. It was then found that the tumour was pedunculated, being attached to the left lateral wall of the hypopharynx just above the pyriform fossa. It was also lightly adherent to the left edge of the epiglottis just below the tip. After these adhesions were separated, the loop of an Eve's tonsil snare was passed over the tumour and drawn tightly round its site of attachment, the growth being finally severed with a long handled laryngeal knife. Persistent oozing occurred from the site of attachment, but was readily controlled by seizing the bleeding point with a long tonsil artery forceps and applying a ligature. The convalescence was uneventful.

On examination the tumour was macroscopically and microscopically a typical lipoma and was covered with mucous membrane. Its shape was somewhat ovoid and measured at its longest diameter 3·75 centimetres.

Comment.

Owing to the rarity with which lipomata occur in the hypopharynx and larynx, scant reference is to be found in the literature.

Shattock[1] records a case of a large lipoma growing from beneath the mucosa of the anterior surface of the epiglottis and the base of the tongue. It caused sudden death by suffocation. Apparently the patient had involuntarily attempted to swallow his own tumour, so that it had become suddenly engaged in the grasp of the pharyngeal constrictors and, together with the epiglottis, was found at autopsy to be tightly impacted over the upper aperture of the larynv. Shattock in the same article also records eight other cases collected from the literature. In one case the tumour filled the pharynx and extended downwards into the œsophagus for 22·5 centimetres (nine inches).

In addition to growing from the base of the tongue and the pharyngeal wall, a lipoma may also arise from the ary-epiglottic folds and from the hinder wall of the larynx.

Shattock states that fat cells are normally present in these situations, hence the actual site of these tumours presents no histological difficulty.

They are of clinical interest from the fact that they may cause sudden death by suffocation or cause difficulty with deglutition or as in the writer's case, alter the tone of the voice.

McBride[2] records a lipoma growing from the base of the tongue and epiglottis which showed some tendency to recur, as it reappeared twelve months and eight years respectively after its first removal.

In the writer's case the patient did not experience any difficulty with deglutition or resepiration. This was due to the tumour having become adherent to the epiglottis. Thus it was anchored in an upright position and prevented from falling down over the larynx or into the œsophagus. Its removal demonstrated very clearly the absolute command of the situation which one has when using the suspension laryngoscope for work in this region. Not only was the tumour itself easily removed, but the ligation of a bleeding point low down in the pharynx was a matter of little difficult.

References.

[1] S. G. Shattock: "A Large Laryngeal Lipoma of the Epiglottis and Base of the Tongue, with a Collection of Examples of Submucous Lipomata of the Intestine and Larynx," *Proceedings of the Royal Society of Medicine*, March, 1909, page 285.

[2] P. McBride: "Specimen of Fatty Tumour of the Epiglottis," *Proceedings of the Laryngological Society of London*, December, 1896, page 17.

TWO INTERESTING CASES OF HYSTERIA.[1]

By RALPH NOBLE, M.B., Ch.M. (Sydney), D.P.M. (Cantab.),
Honorary Physician to Psychiatry Clinic, Royal Prince Alfred Hospital; Honorary Neurologist and Psychiatrist, Lewisham Hospital, Sydney.

D.P., A FEMALE patient, a partly trained nurse, aged twenty-one years, was the second of seven children. During the four months previous to admission to hospital on April 23, 1929, and for some weeks subsequent to admission this patient had been in the habit of violently contracting the *rectus abdominis* and sterno-mastoid muscles. The contractions followed each other rapidly and persisted without ceasing from awakening in the morning until sleeping at night, but without much distress to the patient. During anæsthesia the movements disappeared, but they reappeared before consciousness returned.

The history showed that the girl was unhappy away from home and was returned from hospital, where she had been employed as a nurse because of ill health. For the past twelve months she had been at home and had been complaining of varying symptoms, all of a subjective nature. A little while before the muscular movements commenced, she was awakened by an alarm of fire at midnight and was quite dazed and unable to carry out any purposeful action regarding the fire.

During her stay in hospital she lay in bed quietly at times, but frequently, especially when observed, the abdominal muscles contracted in a regular manner for some two or three hours. At times she would throw her head from side to side. On several occasions she failed to pass her urine for more than twenty-four hours, but she was not at all anxious about this condition.

She was a girl of average intelligence, not easily excited and was rather dull emotionally. On examination there was no evidence of any organic nervous disease. The reflexes were all present, the cerebro-spinal fluid was normal, and the blood did not react to the Wassermann test.

The condition gradually improved with treatment by isolation, massage and a bromide mixture and she was allowed a trial with friends. The sympathy proved too much for her and she soon relapsed and had to be readmitted to hospital. More rigid isolation was carried out and finally the condition entirely disappeared and she returned home quite well after another trial with her friends.

The motive underlying this hysterical phenomenon was apparently the desire for sympathy and attention and the wish to live at home rather than attempt to earn her living in the community.

The second patient presented was E.M.F., a school girl, twelve years of age, who was admitted to the hospital on April 16, 1929. On admission this patient exhibited slight jerky movements of the body, limbs and head, which had existed for more than eighteen months. She had also been in hospital on two previous occasions during the past two years with a somewhat similar condition.

It was decided to isolate this patient, but considerable difficulty was experienced as she insisted on pulling aside any screens which were placed near her bed, so that she could see what was going on in the ward. She was moved from one part of the ward to another and it was noticed by the physician that she was occupying a bed next to the patient D.P., described above. The physician drew the attention of the sister in charge of the ward to the importance of keeping this patient quite away from D.P., because of the possibility of E.M.F. copying her particular hysterical phenomena, and E.M.F. was accordingly removed to a different ward altogether within twenty-four hours of her being in the bed next to D.P.

On the following day a very interesting development occurred. The patient E.M.F. exhibited muscular contractions exactly similar to those of D.P., but they were even more violent in their intensity. They were a very close imitation of the muscular movements exhibited by D.P. E.M.F. had never shown contractions of these muscles before and was not in any way distressed by them. They subsided in two weeks' time and the patient had lost all her original symptoms when she was subsequently sent to a convalescent home.

This case was of interest for the following reasons:

1. It demonstrated the importance of suggestion as a factor in hysteria.
2. It was evidence of the difficulty of attempting to treat such patients in the large wards of a general hospital where successful isolation was so difficult to obtain.
3. It indicated the difficulty of ascertaining the underlying factors which were responsible for the recurrence of hysterical phenomena in certain psychopathic individuals.

[1] The patients described herein were presented at a meeting of the New South Wales Branch of the British Medical Association on May 16, 1929.

Reviews.

A BOOK FOR THE DIABETIC.

DR. ELLIOTT P. JOSLIN has issued the fourth edition of his "Diabetic Manual"[1] for the mutual use of doctor and patient.

[1] "A Diabetic Manual for the Mutual Use of Doctor and Patient," by Elliott P. Joslin, M.D.; 1929. Philadelphia: Lea and Febiger; Sydney: Angus and Robertson, Limited. Post 8vo., pp. 248, with illustrations. Price: 10s. net.

In this new edition the author sets out to develope three thoughts; first, that the patient can master his disease if he wills; second, that his own length of days after his diabetes begins is in some degree a measure of the success he achieves; and third, that he has an excellent chance, by living long and well, to be an explorer of regions of diabetes hitherto unknown and thus to open up trails towards health and the cure of diabetes which others can more easily follow. Surely very excellent thoughts!

The book is essentially one for the patient; it is so extraordinarily cheerful in its outlook and so simply written. Any one of average intelligence can understand it and, reading it, must necessarily be helped along the path to health by reason of its justified optimism. The opening page should hearten the diabetic patient by showing how good a diet can be taken and when he reads further on of the wonders worked by "Insulin," he should surely be helped to make up his mind to undergo proper treatment. The book is full of sound advice and helpful suggestions; it urges adequacy but care of diet, gives many recipes, outlines restaurant meals and picnic meals and is in fact a book that should be in the hands of every diabetic patient and of the practising members of the medical profession as well.

PHYSICAL ASPECT OF X RAYS.

"THE PHYSICS OF X-RAY THERAPY," by W. V. Mayneord, is a small volume containing a mine of information and will be welcomed by radiologists.[1]

The early part of the book is devoted to consideration of the general properties of X rays and the various types of primary and secondary radiations emitted from an X ray tube.

The complex reactions set up when X rays fall on matter, are discussed and a description given of primary and scattered radiations, absorption of X rays and the effect of filtration. The most valuable section of the book is that devoted to the consideration of practical methods of measuring X ray dosage. A sound knowledge of the various means of estimating quality and quantity of X rays is essential to a radiologist and in this section the various methods are carefully described and compared. The author concludes and it is indisputable that by far the most exact and practical of these is the ionization method. A chapter is devoted to the distribution of X radiation within a mass of tissues and to the various factors to be taken into account when giving therapeutic applications.

A very short description is given of the physical principles underlying the construction of X ray apparatus.

No actual new ground is covered, no new theories are advanced but the author has presented us with a concise lucid account of the physical aspects of X ray therapy and the book is written in an easy readable style.

GRAPHIC SURGERY.

THIS is the age of visual entertainment and instruction. Professor Naegeli in the preface of his small book entitled "A Graphic Guide to Elementary Surgery," which he describes as an experiment as an introduction to clinical surgery,[1] quotes the ancient Chinese proverb that "a picture is worthy more than many a thousand words." It is an attempt to fix in the student's mind by means of diagrammatic illustrations what he has seen in his ward work. But many of his pictures could be described in far less than even one of the thousand words. Methods of technique and examination, pathological conditions and anatomical arrangement are pictured in simple and elementary forms, with complementary text which is lucid and brief. The criticism which must be made, is that many of the subjects illustrated are so elementary as to be unworthy of illustration. Three drawings to show a denture *in situ* in the mouth, the denture being removed and finally a chloroform mask on the face to remind the student of this necessary precaution prior to anæsthesia or a line drawing of a body with a clinical thermometer in the rectum and one in the axilla to illustrate the differences in temperature in these regions are examples. The book would be of distinct value to the student who had little or no opportunity for practical hospital work, but while there are several valuable and instructive diagrams such as those illustrating Trendelenburg's signs both in varicose veins and in dislocated hip, there is too little that fills any gap in the clinical teaching in our medical schools to give cause to recommend it. On the other hand, it should be extremely helpful to nursing trainees.

MEDICINE AND THE MIND.

IN "Health, Disease and Integration" Dr. H. P. Newsholme, an eminent authority on public health, has attempted to establish a spiritual relationship with the most modern psychical and physical conceptions of disease and has succeeded in producing a work reminiscent of the scholasticism of the fourteenth century.[1]

He has, it appears, been impressed with the observation that in several cases of *encephalitis lethargica* that have come under his notice the onset of the illness has been preceded by some recent or more remote emotional stress. This leads him to develope the rather astounding thesis that mental stress alone may produce a "purely natural living enzyme or virus which would, on occasion, cause a syndrome indistinguishable from that arising from extraneous infection," moreover, "the virus could presumably be filtered, and the filtrate produce secondary cases by inoculation."

The author does not very closely define the term integration which plays so important a part in his arguments, but it apparently refers to a state of poise between the body and mind and disease would seem to arise when the mind is distracted from attending to its important duty of keeping carefully balanced the anabolic and katabolic functions of the body.

That we should be very careful not to allow the mind to get at all slack in its duties is painfully illustrated in the case of a lad who developed the chill preluding pneumonia while cleaning his bicycle in the open on a bitter, cold day, for "in the afternoon in question he was in two minds whether to go to watch a football match" —"there was therefore some mental perturbation likely to intrefere with full bodily tone."

Those who are convinced by the reasoning contained in the three hundred odd pages between the covers of this medical novelty, may see fit to sheet home the responsibility for our own July epidemic of pneumonia to the Income Tax Commissioners.

If the author is truly a "Daniel come to judgement," the curriculum in our medical school must be revised, for, to quote the last words of the thesis, "Medicine, to be effective in its proper domain, must be intimately interwoven with the art and science of Religion. Medicine is only at the verge of its real sphere of activity, on which it will enter when it can systematically treat the individual as an intimate moulding, not merely of body and mind in their delicate adjustment to each other, but of body and mind as the vessel for the reception and expression of the spirit."

[1] "A Graphic Guide to Elementary Surgery," by Professor Dr. Th. Naegeli, Translated by J. Snowman, M.D., M.R.C.P., with an Introduction by Dr. C. Garré; 1929. London: John Bale, Sons and Danielsson, Limited. Royal 8vo., pp. 205. Price: 12s. 6d. net.

[1] "The Physics of X-Ray Therapy," by W. V. Mayeord, M.Sc.; 1929. London: J. and A. Churchill. Post 8vo., pp. 185, with illustrations. Price: 10s. 6d. net.

[1] "Health, Disease and Integration: An Essay Based on a Study of Certain Aspects of Encephalitis Lethargica," by H. P. Newsholme, M.A., M.D., F.R.C.P., B.Sc., D.P.H.; 1929. London: George Allen and Unwin, Limited. Demy 8vo., pp. 327. Price: 12s 6d. net.

The Medical Journal of Australia

SATURDAY, NOVEMBER 23, 1929.

Commercial Morality.

TRADE is usually defined as buying and selling or as occupation. Trade is regarded as a particular branch of industry and the term commerce is properly used to denote trade on a large scale. While the term trade is often opposed to craft, profession or art, it is not illogical to state that every individual who has a calling, and who lives on the proceeds of that calling, is a tradesman. Some sell goods or commodities manufactured for the purpose or collected from Nature's store; some sell their skill in manufacture, in production, in collection. Some sell ideas, some sell advice, some sell their services in supervising work, in keeping books of account, in controlling financial arrangements, in taking charge of money and other property. Each one has something to sell and sells it for more than he has to pay for it. Provided that the goods, services or ideas are true to label and have a real value to the persons to whom they are sold, the trade may be regarded as an honest one. Unfortunately the world is not moral and men are inclined to sell goods that are not what they are said to be. The smartest business men demand the highest price for goods or services that they can obtain. Whether a high price is or is not morally justifiable must depend on the circumstances of the deal, on the nature of the commodity sold or on the form of service rendered. Although it is usual and comfortable to judge professional services as if they had nothing to do with trade, it would be to the advantage of the public if some estimate were made to determine whether the service rendered is true to label and whether it is worth the price demanded for it. It may be extremely difficult to assess professional services at their proper value. These services are offered on the assumption that the seller is in possession of sufficient knowledge to enable him to exercise reasonable judgement, to render it possible for him to profit by the experience of others and to avoid making many serious mistakes. He is supposed to have acquired skill and some degree of ingenuity. Exceptional talent, an unusual perfection of technique, rare intellectual or manipulative ability will necessarily enhance the value of the service. In certain professional occupations the untutored person is obviously incapable of judging the nature of the service; an opinion formed by a layman concerning the work of an architect, an engineer, a biologist, a lawyer, a medical practitioner or an analytical chemist may be quite unreliable. There is, nevertheless, a minimum standard of excellence of the work, below which it should be regarded as not true to label.

The public is prepared to accept the services and goods of irregular medical practitioners and of the patent medicine vendors and to pay for these services and goods the price fixed by the seller. The unqualified practitioner offers his services by advertisement and by written, printed or spoken commendation. If a man offers to treat one or many disease and particularly if he promises to cure those diseases, he should be required to pay a suitable penalty if the services are not based on reasonable knowledge and skill. It is held to be impracticable to prohibit a charlatan from treating patients for any disease, but the law should demand of every unregistered medical practitioner who engages in practice or who offers his services for this purpose, evidence that the diagnosis is made with reasonable care and on the basis of adequate knowledge, that the treatment employed is based on satisfactory evidence that it can effect what is expected of it and that the treatment is genuine. The unqualified practitioner usually trades on the unwillingness of his client to give evidence against him. If a dairyman offers for sale milk adulterated with water, he is prosecuted by the agents of the public health or other authority. It should be the duty of the department of the ministry charged with the protection of the public health to shadow the advertising quack and to ascertain whether his diagnoses and treatment are true to label or whether he has sold to his client something that is fraudulent. The law should

be amended so that an unregistered person who undertakes the treatment of disease, should do so at his own risk and that he should be required to produce evidence from time to time that he is competent to differentiate one disease from another and to select remedies that may alleviate or cure and to exhibit such remedies with reasonable care and skill.

The patent medicine vendor, the proprietor of secret remedies and the manufacturer of medicaments should also be compelled to produce evidence that what they sell is true to label. Reputable firms of manufacturing pharmaceutical chemists do not as a rule make sweeping claims for their products. When a new chemical or biological substance is placed on the market by the firms that have gained the confidence of the medical profession, the constitution and nature of the substances are explained and to this is attached a plain statement of the results of pharmacological investigations that have been carried out with these substances by trained and competent persons. The medical profession becomes suspicious of a firm that advertises to the public. The firm that advertises that this or that product cures a disease or produces a more powerful effect than any other known medicinal agent, should be compelled to produce real evidence of the truth of these published statements. The immorality of the majority of the advertisements of proprietary preparations published in the daily press is so apparent that it is nothing less than amazing that they should be tolerated. Incidentally the newspapers that accept payment for advertisements containing exaggerated and untrue claims, should be indicted as accessaries to the fraud. It would be quite easy to protect the public from this dangerous and immoral traffic, if those who offer services connected with the treatment of disease were required to produce evidence that what they sell is true to label.

Current Comment.

ULTRA-VIOLET RADIATION.

AMONG the physical therapy agents which have become widely used during the last few years, ultra-violet light occupies a prominent place. Success with every new method of treatment is invariably followed by a widening of the so-called indications for its use. Amelioration of symptoms and recovery occur either because or in spite of the treatment and the enthusiast immediately ignores the *post hoc* and embraces the *propter hoc* explanation. He may be right, but it is certain that he will very often be wrong. He is aided and abetted in his views by the importunate salesman and by the voluminous literature of the manufacturing house. Nor is he deterred by the medical practitioner who rushes into print on the smallest pretext either in current journals or in books written as a sort of encyclopædia of all the conditions in which the method should be used. No one doubts for a moment that ultra-violet radiation is a weapon which can be used with advantage in many conditions. The work which was done by Hariette Chick and her collaborators in Vienna on rickets and the astounding results obtained by Rollier in the treatment of tuberculous persons by heliotherapy alone need to be mentioned to prove this. Where doubt exists is in the application of ultra-violet light in general medical practice.

Properly controlled observations on the value of ultra-violet light are few and far between. It will be useful to consider the results of a recent investigation undertaken by Dora Colebrook on behalf of the Medical Research Council.[1] The investigation was twofold in nature. The first part consisted in a study of the effects of irradiation of school children by ultra-violet light and the second part consisted in the irradiation of varicose ulcers.

The first part of the investigation was carried out in a Willesden Council infant school. There were 250 children on the register divided into seven classes; the ages varied from five to seven years and the number of boys exceeded that of the girls. The children who were treated, wore only bathing slips and shades to protect the eyes. Altogether 287 children were kept under strict medical observation from the end of August, 1927, to the end of March, 1928. One hundred and one children were irradiated by light from a carbon arc lamp with a high output of ultra-violet rays. Ninety-four children were exposed under exactly the same conditions to a similar lamp from which rays of a shorter wave length than 3,200 Ångström units were cut off by window glass. Ninety-two children received no irradiation. The standard aimed at in dosage was to give exposures of such an intensity that an erythema reaction would just be avoided in a child whose skin was of average sensitivity. An attempt was made by slowly increasing the intensity of the irradiation to maintain that level throughout. Although erythema was avoided as far as possible, the majority of those exposed to the unscreened lamp manifested some pigmentation at the conclusion of the inquiry. For the maximum dose the distance of the child from the lamp was 65 centi-

[1] "Irradiation and Health," by Dora Colebrook, Medical Research Council of the Privy Council, Special Report Series, Number 131, 1929.

metres (two feet two inches), the duration of exposure was fifteen minutes, the voltage across each arc was 70 and the current in each arc was 30 ampères. For the minimum dose these figures were 115 centimetres, five minutes, 45 volts, 25 ampères. Records were kept of the height and weight, of the incidence and duration of colds and allied conditions, of the incidence of infectious diseases, of the occurrence of chilblains and of the progress in school work. The findings were remarkable and not what might be expected. They may be summarized by the statement that for the control group and those treated by the unscreened lamp there was an advantage for the former in every respect except the progress in school work and in this the figures were equal. For the control group and those treated by the screened lamp there was an advantage for the former in every way except in regard to the incidenec of whooping cough and progress in school work; in these the advantage was with the group treated with the screened lamp. For the group of those treated by the screened and by the unscreened lamp there was an advantage to the former in all points, except the average duration of each cold in which the figures were equal, and the gain in weight in which the advantage was with those treated by the unscreened lamp. Although the advantages discovered were as has been stated, it is pointed out several times throughout the report that the differences are so small that definite conclusions should not be drawn. It is interesting, however, to note that the subjective impressions gained by Colebrook were indefinite. The balance of opinion among the parents was in favour of those treated by the unscreened lamp and among the teachers those treated by the screened lamp had the advantage.

In regard to the second investigation, that dealing with varicose ulcers, it is unnecessary to give details. It must suffice to state that no advantage was found from the use of ultra-violet light. Furthermore, relief of symptoms was not obtained with light treatment. The ulcers dressed with simple bandages and treated with light responded much less satisfactorily than those dressed with Unna's paste. Amongst ambulant patients no ulcer was cured by light treatment, but about three-quarters of those treated by Unna's paste were cured.

It will be admitted at once that Colebrook's series is a small one and that the time of observation of the children is comparatively short. In the preface to the report the Medical Research Council points out that it would be legitimate for anyone to criticize the work on the ground that unsuitable doses were given or that the doses were applied at unsuitable intervals of time or that the wrong rays were used. They hold, however, that this would be justifiable only if evidence were produced that some kind of radiation, applied under conditions attainable in the wholesale treatment of school children, has a beneficial effect demonstrable under conditions as critically controlled as those of Colebrook's experiment. It is not proposed to discuss this aspect further, but to point out that the children on whom the observations were made, came from surroundings which might be looked on as conducive to bad health. They would represent the type of child to whom ultra-violet radiation might be applied empirically as a health measure. The results of the treatment of varicose ulcers are also of interest and demonstrate the futility of the use of ultra-violet radiation as a routine measure in this condition.

The consideration of this work raises the whole question of the ethics of treatment. When such carefully applied and controlled treatment as that of Colebrook does not give expected results, the chances that the occasional user will achieve success are rather remote. A medical practitioner is bound to give his patient the benefit of the simplest form of treatment available unless it is definitely contra-indicated. Because a man is a surgeon, he should not adopt surgical measures if an operation with its attendant risks can be avoided. At the same time there are occasions when the physician should hand the patient over to a surgeon. The medical practitioner who has dressed his "shop window" with elaborate electrical apparatus, must not use it if there is another and more suitable method available. Still less should he use ultra-violet radiation when he knows full well that the chances of success are remote or non-existent. A case in point is the irradiation of varicose veins in the hope of effecting a cure. He will probably impress his patient by his ability to manipulate electrical contrivances and the patient will go away as contented as Naaman, the Syrian of old time, was discontented with Elisha, the prophet. The proper point of view is not whether ultra-violet rays can be used, not whether the patient will be suitably impressed, not whether his treatment will help to pay for the upkeep of the expensive apparatus, but what sort of treatment is most suitable from the patient's point of view, that is the point of view of rapid, complete and permanent cure.

URETERAL REPAIR.

In repair of the ureter by anastomosis stenosis is a complication to be feared. Marc Iselin has carried out some experimental work in dogs which he claims makes its occurrence unlikely.[1] He divided the ureter in dogs and repaired it by end-to-end anastomosis. He performed pyelostomy and used a bougie as a plug to the ureter. After five days he removed the bougie, the urine took its normal course and the fistula closed. He lays stress on the necessity for removal of the redundant mucosa to prevent eversion of the ureteral wall. The author's suggestion that clinical trial of the method should be made, is worth considering.

[1] *Surgery, Gynecology and Obstetrics*, October, 1929.

Abstracts from Current Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

Fatal Bacillus (Salmonella) Suipestifer Septicæmia.

JOHN T. BAUER AND MARGARET MCCLINTOCK (*The Journal of Infectious Diseases*, April, 1929) record a case of fatal septicæmia in man due to *Bacillus suipestifer*. Full clinical notes are given and all the cultural and serologic reports on the organism. The authors mention the necessity of considering *Bacillus suipestifer* as an agent in the production of febrile conditions simulating typhoid fever, especially when organisms of the paratyphoid group are isolated from the blood and all agglutinations with stock strains of *Bacillus typhosus* and *Bacillus paratyphosus A* and *B* fail. *Bacillus suipestifer* infections in man are not numerous, but it is not unlikely that they are frequently unrecognized. Confusion as to the identity of the organism is responsible for a lack of accurate knowledge as to the incidence of infections in the past and this may account for failure to find more instances of this infection in man. In the case recorded by these authors the organism was isolated from the blood on three occasions and its close relationship to *Bacillus suipestifer* was indicated by the presence in the patient's blood of agglutinins for *Bacillus suipestifer* as well as by cultural similarity. The source of the infection remained undetermined.

Bacteriophage Treatment of Staphylococcal Infections.

ON the basis of hypothesis and laboratory investigation, animal experimentation and previous clinical experience N. M. Larkum (*Journal of Infectious Diseases*, July, 1929) has made an attempt to justify the use of bacteriophage filtrates in the treatment of staphylococcal infections. He has submitted clinical results from three hundred patients which indicate that bacterial filtrates have been effective in the treatment and prevention of staphylococcal infections. In the majority of instances the inoculation of bacteriophage in staphylococcal infections causes a reaction which as a rule is extremely mild; yet the immunity produced is apparently complete and of considerable duration. In one group of patients vaccine treatment had been tried previously without benefit. Eighteen of this group gave the following results with bacteriophage treatment. Thirteen after two inoculations developed no further lesions during the succeeding six months, one was improved and the condition of four remained refractory. The author states that it has been by no means shown that it is the bacteriophage itself which is responsible for much of what has occurred in these patients. The filtrate used contained bacteriophage and it was through the action of this principle that the proteins were made available, but as to which of the various elements found in the filtrates was the active agent, no conclusion was reached. Further clinical results are desirable. Other questions remain to be answered; most important of these is that of dosage, not alone the amount of material, but the method of adminstration. Furunculosis was not the only condition treated. Patients with acne, *hordeolum*, osteomyelitis and miscellaneous staphylococcal infections such as pyelitis, empyema and *otitis media* were also treated by the bacteriophage filtrates and full reports are given. The dosage, reactions and results are given in detail.

Investigations in Sporadic Cholera.

THOUGH the cholera vibrio has long been recognized as the causative organism in cholera, F. J. Palmer (*Journal of Tropical Medicine and Hygiene*, April 1, 1929) expresses his doubts concerning the place of this organism in the ætiology of sporadic cholera in Assam. The comma bacillus is not always easily discoverable in cholera stools, even when cultural methods are used. Inoculation against cholera is of doubtful value. Many inoculated people have been stricken with the disease in a highly virulent form. From the stools of patients suffering from sporadic cholera the author has isolated an organism which he has called *Bacillus cachari* (Palmer). This bacillus is a member of the coli group, exhibits bipolar staining and differs only from *Bacillus grünthali* and *Bacillus para-grünthali* in that it does not ferment dextrin. Agglutination of this organism was effected by the action of serum from persons recently recovered from cholera, but several strains varied in their susceptibility to supposedly normal serum. The author concludes that though his bacillus is common in cholera stools, it cannot yet be incriminated as the causal organism of cholera.

The Specificity of Scarlatinal Hæmolytic Streptococci.

GEORGE MORIWAKI (*Journal of Bacteriology*, September, 1929) has made an experimental study with regard to the specificity of scarlatinal hæmolytic streptococci with special reference to the rash developing possibility. He was unable to differentiate scarlatinal hæmolytic streptococci from non-scarlatinal strains by means of agglutination, precipitation or complement fixation with convalescent scarlatinal sera. He found that the toxins of non-scarlatinal hæmolytic streptococci would produce skin reactions in a dilution as high as one in 1,000 and that the toxins of non-scarlatinal hæmolytic streptococci can be neutralized by scarlatinal convalescent sera, though with less constancy. Antitoxic sera against erysipelas hæmolytic streptococci exerted similar effects on scarlatina and immunization with non-scarlatinal hæmolytic streptococci gave rise to the blanching phenomenon. Toxins of erysipelas streptococci produced a rash when injected in a certain amount in appropriate persons. The rash caused by the toxin of hæmolytic streptococci of scarlatinal as well as non-scarlatinal origin is identical. The author concludes that scarlatinal hæmolytic streptococci are those strains of streptococci which possess a stronger tendency to produce rash in the human subject and also to act as stronger antigens for the blanching phenomenon. It was found that injections of the toxins of non-scarlatinal hæmolytic streptococci in a positive reactor can eliminate the response to the Dick test.

Bacteriology of Post Mortem Specimens.

HENRY F. HUNT, ETHEL BARROW, LUTHER THOMPSON AND GEORGE W. WALDRON (*Journal of Laboratory and Clinical Medicine*, July, 1929) have carried out bacteriological studies in 567 *post mortem* examinations. Cultures were made from the heart blood, liver and spleen of unrefrigerated bodies one to twelve hours after death. It was found that the lapse of twelve hours after death did not affect the results. The comparison of simultaneous cultures from the heart blood, liver and spleen showed that the blood was a better indicator of terminal bacteriæmia than either the liver or spleen. Whether this is due to inhibitory or bactericidal influences of these organs, the authors are unable to say. Cultures were obtained more often from the liver than from the spleen. The percentage of positive *post mortem* blood cultures obtained by each worker was 31, 43·7, 24 and 20·7 respectively. In all but one instance in which blood cultures were positive, definite foci of infection were demonstrated. The exception was in a body of a patient who died from acute lymphatic leuchæmia and a culture of hæmolytic streptococci was obtained from the heart blood, liver and spleen, but no infective foci could be found. The patient had had a temperature as high as 40° C. (104° F.) before death. It was also found that the number and type of conditions in which infective foci were definitely present, were definitely related to the percentage of positive blood cultures. From the uniformity of these results the authors believe that *post mortem* bacteriological examinations are reliable and, if carried out carefully and as a routine, often reveal the exact cause of death. The literature on the subject is fully reviewed.

The Schultz-Charlton Test and Serum Dilution.

MARGARET E. WYLIE (*Journal of Infectious Diseases*, July, 1929) has shown that the blanching power of a serum used for the Schultz-Charlton test is not directly proportionate to its dilution or concentration. The technique used is described in full. With very dilute solutions the results are shown to be quite unreliable, though it is possible to get a positive

result with an antiserum diluted to one in 36,000. In general the number of positive results decreased as the serum was rendered more and more dilute, but the proportion of positive results did not diminish directly with the progressive dilution of the serum. In practice it is shown to be inadvisable to use a dilution higher than one in 100, but if the serum is diluted, it matters little whether the strength used is one in ten or one in 100. The most accurate results are given by undiluted serum. The question of the time interval between the injection of the serum and the appearance of blanching was investigated and found to vary from one to forty-eight hours. There was no relation between the dilution of the serum and the time of the appearance of the blanching, so that no assistance in determining the potency of a serum could be obtained from the consideration of the time interval of the Schultz-Charlton reaction. The author concludes that the Schultz-Charlton technique cannot be regarded as even a rough method of estimating the potency of a serum.

HYGIENE.

Lead Poisoning in Industries.

IN a lecture delivered at the Royal Institute of Public Health, Thomas Oliver (*The Journal of State Medicine*, April, 1929) reviews the position with regard to lead poisoning in the more important industries over a quarter of a century. He points out that regulations have done more to save human life and suffering in the lead industry than in any other. While the notifications of poisoning in Great Britain from 1900 to 1926 had declined from 1,058 to 242, the deaths notified had not shown a similar decline. This was due doubtless to the death of old workers who had long been disabled. The author reviews the mining and smelting of lead with the manufacture of white and red lead and litharge and points out that the severe forms of poisoning characterized by double wrist drop and encephalopathy are rarely seen. The cooperation of employers with employed in observing regulations and the rules and teaching of personal hygiene have resulted in a striking decrease in the notifications of poisoning from white and red lead which is paralleled by the effect produced by the introduction of the "fritted lead silicate glaze" into the pottery industry. Plumbism among men employed in breaking up old ships has occurred since the war. The symptoms have been mostly of a mild nature and a great decrease in incidence followed the use of masks and an order advising the men to work as much as possible on the lee side. Plumbism still occurs among painters, largely from the "dry rubbing down" process. The prohibition of dry rubbing down and the restriction of the use of lead in interior painting are expected to reduce the incidence of poisoning. The manufacture of electric accumulators is responsible for a striking increase in lead poisoning, which is, however, mild in character. A sudden outbreak of poisoning in any lead industry is usually due to a breakdown in preventive measures, inattention to cleanliness or carelessness on the part of the employees. An increase of lead poisoning in the rubber goods trade is mentioned. Certain unusual examples of lead poisoning of obscure origin are discussed and the lecture is concluded by a note of warning to medical men regarding the certification of lead poisoning and the responsibility of the medical profession to the community in regard to the working of the *Workmen's Compensation Act*.

Industrial and Public Water Supplies.

E. SHERMAN CHASE (*Journal of Industrial Hygiene*, March, 1929) discusses cross connexions between industrial and public water supplies. More than one epidemic of enteric fever has been caused in America by the pollution of public by private water supplies. The object served by the introduction of cross connexions is to maintain a constant head of water in the private supply for emergencies such as fire. In the absence of an efficient valve system the fall in pressure of the public supply may result in pollution. Several of the United States have passed legislation regulating this practice and certain interested professional societies have expressed resolutions in this regard. The author emphasizes the value of the all bronze double check valve system and the special fire pump chlorinators. These devices must be submitted to regular inspection, testing and overhauling.

The Dust Hazard in the Abrasive Industry.

W. IRVING CLARK (*Journal of Industrial Hygiene*, March, 1929) reports a study of the dust hazard in the abrasive industry. Using the classification of silicosis advocated by Pancoast and Pendergrass, he examined by radiographic and clinical means three groups of workers exposed to large quantities of artificial abrasive dust over a period of more than ten years. The first group of sixty-nine men had been examined with ten others four years previously and had manifested no symptoms or serious illness in the intervening period. Six of the original examinees had died, four from respiratory affections; the remaining four had left the company's employment. The term of employment of this group at the time of the second examination varied between sixteen and forty-two years. In three instances the radiographic picture of an established silicosis was observed, while only twelve showed no sign of silicosis. Two of the three definitely affected persons had worked for many years in a department in which there was much clay dust containing 9% of free silica. The second group consisted of forty-five men who had all worked in dusty departments for periods varying between ten and twenty years. Twenty were unaffected by silicosis and twenty-two were in an early stage, while three had definite silicosis. The third group consisted of twenty-three men who had each just completed ten years' work in dusty departments. Of these thirteen had early silicosis and the other ten were normal. No instance of active tuberculosis was observed, although eleven patients with suspended healed tuberculosis were observed in the first two groups. The condition of these men demonstrates the possibility of men in such condition working for considerable periods in abrasive dust without the tuberculous process being activated.

Viability of Hookworm Eggs and Larvæ in Latrines.

G. DIKMANS (*American Journal of Tropical Medicine*, May, 1929) describes his investigations into the viability of hookworm ova and larvæ in pit latrines in Porto Rico and records the results of his observations. The experiments were undertaken with a view to discovering how long hookworm ova remain viable in a pit latrine; whether they develope there into infective larvæ; whether larvæ escape from the latrine into the surrounding soil and become dangerous to man. Fæcal material containing living hookworm ova was placed in three jars to one of which nothing was added, while to the other two fresh urine and liquid from a local pit latrine were respectively added. At the completion of periods varying from five to twenty-eight days the material was examined. In sixteen of twenty-four experiments larvæ were recovered from those jars in which infected stools only had been placed; no larvæ were recovered from those to which urine only had been added; in six of thirty-six experiments in which latrine liquid had been added to the stools, hookworm larvæ were found. The author regards their presence in three of these instances as due to an error in technique; their presence in the remaining three he believes may be explained by the adherence of fæcal material to the side of the jar where it was not subject to the influence of the latrine fluid. Viable hookworm ova were frequently found, in one instance twenty-eight days after the stool had been passed. For a further experiment urine and fæces containing hookworm ova were placed daily in a small pit until the bottom was covered to a depth of some five to eight centimetres. No hookworm larvæ were recovered from the fæces, but some were found in the soil immediately surrounding the fæces and soil from the sides of the pit at distances ranging from five to thirty centimetres from the level of the fæcal material. Examination of the soil immediately behind a pit latrine did not reveal the presence of hookworm larvæ, though the latrine was used constantly by people infested with hookworms. The author concludes that properly constructed pit latrines are an effective aid in a hookworm campaign.

Special Abstract.

RADIOTHERAPY OF CANCER OF THE UTERUS.

A REPORT of the Radiological Subcommission of the Cancer Commission of the Health Organization of the League of Nations together with a brief *résumé* of the work of the Cancer Commission by its President, Sir George Buchanan, has reached us recently with a request for a review. The contents of these documents are of considerable importance and it would serve a more useful purpose if we presented our readers with a full summary than if we discussed the reports critically. Moreover, no one is yet in a position to form a reliable evaluation of the radium and X ray treatment of cancer of the uterus.

Sir George Buchanan's report covers three phases of the work of the Commission. The first is concerned with the question of heredity. While previous investigations have led to the conclusion that there was little scientific or statistical evidence in support of the existence of heredity as an ætiological factor, Professor Deelman has recently collected further data which appear to reverse this conclusion. Some suggestive information is being collected in Poland, Japan and Italy in connexion with the relation of cancer and constitution.

The second subject that is being investigated at the present time, is the incidence of occupational cancer. No details are given.

The third endeavour of the Cancer Commission is concerned with the investigation into the value and technique of radium and X ray treatment of cancer of the uterus. The recognition of the curative properties of radium has created a demand for this costly element. The subcommission to which the question was referred, realized that it would be advisable to select a small number of institutes with extensive experience of radium treatment of uterine cancer and to demand a standard of five years' freedom from signs as evidence of cure. Three clinics were chosen. It was found that the methods adopted at Stockholm, at Münich and at Paris were so different that it was impossible to compare the results or to handle the statistics in a single report. It had been the intention of the commission to collect the data and to have them collated by Dr. Jane Lane-Claypon. Unfortunately this plan had to be relinquished. Instead, each director has submitted a report on the experience at the institute under his charge.

The report of the subcommission[1] contains six separate chapters. The first two are of a general character. Chapter III is a report by Dr. J. Heyman on the technique and results of the treatment of cancer of the *cervix uteri* at the Radiumhemmet in Stockholm. Chapter IV is a report by Professor F. Voltz from the Radiological Section of the Gynæcological Clinic in Münich. Chapter V is the report of Dr. D. A. Lacassagne on radiotherapy of epithelioma of the *cervix uteri* at the Radium Institute in Paris. Chapter VI is a memorandum on the organization of an effective campaign against cancer of the uterus by Professor Claude Regaud of the Radium Institute of Paris.

In the course of the reports the term radiotherapy is used to include radium and Röntgen ray treatment; Stage I of carcinoma of the *cervix uteri* is understood to imply that the growth is limited strictly to the cervix and the uterus is mobile; in Stage II the lesion has spread into one or more fornices with or without infiltration of the parametrium, the uterus retaining some degree of mobility; in Stage III there is nodular infiltration of the parametrium on one or both sides with limitation of mobility of the uterus or there is more or less superficial infiltration of a large part of the vagina with a mobile uterus or isolated metastases are present in the pelvic glands with a relatively small primary tumour or there are isolated metastases in the lower part of the vagina. In Stage IV are included all growths involving massive infiltration of the parametrium on both sides, all tumours involving the bladder or rectum, growths infiltrating the whole vagina or one vaginal wall with fixation of the primary growth along its entire length. When there are remote metastases, the classification is Stage IV. In addition to these and other definitions the subcommission has drawn up other rules as a basis for all future investigations. Copies of record cards are included, data are specified for statistical purposes, rules for the computation of the results obtained by treatment are formulated and full instructions are given in regard to the necessary information concerning the technique of treatment. While these details must be studied by all investigators who will submit reports of radiotherapy of uterine cancer for comparative purposes, it would serve no useful purpose to reproduce the information in this place.

The Experience in Stockholm.

Forssell was the first to apply radium in the treatment of cancer of the uterus in Sweden. He started in 1910 with small quantities and applied ten, fifteen or rarely twenty milligrammes of radium element at a time. Later larger quantities became available and he adopted the technique devised by Wickham. In 1912 and 1913 he increased the quantity of radium and used a filter of from two to four millimetres of lead. By 1915 better results were obtained with heavier filtration, larger doses and less prolonged exposure. In 1914 Forssell set as a standard for radium treatment of carcinoma of the *cervix uteri* the following requirements: A small number of applications, not to exceed three; relatively large quantities of radium at each application, from one hundred to one hundred and twenty milligrammes of radium element; heavy filtration, equivalent to three millimetres of lead; concentration of the whole treatment into a short period, three to four weeks; an interval of one week between the first two applications and of three weeks between the last two, with a total period of irradiation of about sixty hours.

In 1919-1920 he was able to record statistically the results of treatment five years after the completed course. In subsequent years the technique was developed as a result of experience. The quantity of radium employed was increased, with further shortening of the course, the radium application was combined with various forms of Röntgen ray treatment and in certain conditions with operation, radium needles were employed and finally the method known as "radium-at-distance" was tried. The local surface application of radium remains the principal method of treatment for uterine cancer. In the early days radium treatment was restricted to so-called inoperable growths. Later, when the benefit was recognized by radiologists and surgeons, border-line tumours were included and still later radium treatment was applied in early and late growths. Between 1910 and 1918 from 80% to 97% of the tumours were inoperable. The results were so encouraging that Forssner and Heyman expressed the view that it was justifiable to treat all cancers of the cervix with radium. In 1920 the leading gynæcologists in Sweden agreed to cease operating for the time being for cancer of the *cervix uteri* in order to give the staff at the Radiumhemmet an opportunity of proving the value of radium treatment. While the number of operable tumours has increased since 1919, the number of early growths has multiplied at a much greater rate.

The Radiumhemmet Clinic.

The Radiumhemmet was founded in 1910, originally as a private venture. In 1911 it was taken over by the Cancer Society of Stockholm. In 1913 the city of Stockholm and a public subscription initiated by Her Majesty the Queen endowed the institution with about one million crowns. In 1916 the city placed the hospital at the disposal of the Cancer Society at a nominal rental. In 1917 the Swedish Parliament voted 200,000 crowns for the purchase of radium and in 1918 the Government undertook to permit poor patients to travel free to and from the Radiumhemmet. Since 1920 the Government has granted an annual subsidy of 15,000 crowns and a contribution equivalent to 2·50 crowns a day for each patient admitted. The work at the hospital is under the control of representatives of the Government and of the city of Stockholm.

[1] Reports submitted by the Radiological Subcommission of the Cancer Commission of the Health Organization of the League of Nations; Geneva, 1929.

The Radiumhemmet comprises a radiotherapeutic clinic of four wards and five private rooms, having an aggregate of thirty-four beds. In 1927 1,093 patients were treated. In March of 1929 an additional wing with twenty-four beds was added. There is also an out-patient department containing a waiting room, a consulting room and several examination rooms and a small operating unit. In 1927 no less than 5,085 patients were treated in this department. The radium department comprises a single room situated in a remote part of the building. The radium is kept in this room under adequate protection. The quantity of radium sulphate in the institute in 1927 was 2·02631 grammes of radium element. At the beginning of 1928 four more grammes were placed at the disposal of the Radiumhemmet by His Majesty the King's jubilee fund. The Röntgen ray department is contained in five rooms with five compartments for irradiation. Each is isolated from the others. The equipment includes a Siemens "Stabilivolt" apparatus, a deep X ray apparatus made by Järnh, and a universal apparatus manufactured by the same firm. There is also a unit with operating theatres and sterilizing rooms. These are used for small operations in connexion with the application of radium and electro-endothermy. The diathermy apparatus are the Wappler and the Siemens-Reiniger Veifa. There are also record and follow-up departments, a physical laboratory for scientific investigation and control of the apparatus and a department of morbid histology.

The Radium Applicators.

A full description is given of the various forms of radium applicators. In addition information is given concerning the methods adopted for keeping the containers in the position required. The normal method of carrying out the treatment is given and a table is attached to illustrate the calculation of the number of milligramme-hours obtained with each kind of container and tube after a given length of exposure. Variations of method are required under certain conditions. It has been found that the total dose should not exceed 4,500 milligramme-hours in the vagina. Larger doses cause damage to the rectum. The total intrauterine dose is usually 2,200 milligramme-hours, although no ill effects have been noted after 3,000 milligramme-hours. The blood picture is controlled during the course of the treatment. The appearance of a leucopenia or particularly of a lymphopenia is regarded as an indication for a reduction of the next dose. The treatment is interrupted if a rise of temperature occurs up to 39° C., but is renewed as soon as the fever disappears. Special care is taken to select appropriate packs, boxes and other apparatus to fix the radium containers in any desired position. There are several illustrations to amplify the text. Before the first application the patient is given an enema and a vaginal douche. The vagina is plugged with a tampon of iodoform gauze soaked in peroxide of hydrogen. Before the application 0·01 gramme of morphine is injected. Usually an anæsthetic is not needed. Examination and treatment are carried out on the same day. A specimen for microscopical examination is taken after the insertion of the intrauterine capsules. In this way difficulties due to hæmorrhage are overcome. The tumour is never removed, cauterized or destroyed.

Technique.

The combination of radium and deep X ray therapy was tried in 1919 to 1922. At first it was thought that the results were not sufficiently good to justify further trial, but it appears that under certain special conditions the combination may be found to be favourable. Further information will be published on this matter at a later date. Some attempts have been made to determine the therapeutic effect of a combination of radium applied locally and radium-at-distance. Dr. Heyman states that the number of patients who have been subjected to treatment in this manner, is too small and the time since the treatment is too short to justify any conclusions being formed. The impression he has received is distinctly encouraging. From 800 to 1,500 milligrammes of radium are applied from one or two ventral fields when the parametrium is involved. The rays are filtered through two millimetres of lead and a half of a millimetre of copper at a distance of five centimetres.

Results.

It appears that 737 patients were treated between 1914 and 1923. At the end of five years after the termination of the treatment 170 or 23·1% were alive and free from symptoms. He admits that seven of these patients had been operated on. If the seven be excluded, the successes amounted to 22·1%. Among the patients 188 had operable tumours. Excluding six who were subjected to surgical operation, 76 were alive and free from symptoms at the end of five years. This is equivalent to 40·4%. There were 549 patients with inoperable and border-line tumours. At the end of five years 88 or 16% were alive and free from symptoms.

Radium Treatment in Münich.

Professor F. Voltz points out that since 1913 no patient with cancer of the uterus has been treated by surgical operation at the University Gynæcological Clinic at Münich. From 1913 to 1918 the treatment consisted almost exclusively of the application of radio-active substances; since 1918 a combination of radium and X rays has been carried out.

The radiological section of the clinic is equipped with two large Stabilivolt apparatus, two older X ray units and other electrotherapeutic apparatus. Up to date apparatus for calibrating the X ray plant and tubes is available. The radio-active substances consist of five hundred milligrammes of radium and mesothorium.

Method of Treatment.

The plan of treatment under ordinary circumstances is as follows. On the first day the patient is admitted, a clinical examination is undertaken and the mode of treatment is planned. On the second day deep X ray therapy is applied to the pituitary region. On the third day X ray treatment is applied to the tumour. The patient rests on the fourth day. On the fifth day surgical measures are undertaken for diagnosis and on the sixth day the patient again rests. On the seventh day the radio-active substances are applied and on the ninth day she leaves the hospital. Eight weeks later she is again admitted to hospital. On the second day she receives X ray treatment and on the fourth day treatment by radio-active substances. She rests on the third and fifth days and leaves the hospital on the sixth day.

Professor Voltz states that no harm has been experienced from the irradiation of the pituitary gland. He is convinced that it sensitizes the cancer. Two fields are chosen, each having a surface area of forty-eight centimetres. The focal distance is thirty centimetres. The tubes are run at two hundred kilovolts with 2·5 milliampères of current. The filtration is one millimetre of copper. Each field receives 30% of the erythema dose.

The deep X ray therapy comprises irradiation from one abdominal and one dorsal field, usually covering an area of ten by fifteen centimetres. The focal skin distance is from fifty to sixty centimetres. Each irradiated field receives 90% of the erythema dose. If the condition of the patient is doubtful, the dose is reduced to 33% or 50% of the erythema dose and this is repeated on two or three consecutive days.

For the radium and mesothorium treatment use is made of intrauterine, intracervical and vaginal applicators; brass filters one millimetre thick are employed. The primary filtration is through 0·2 millimetre of silver. Tertiary filtration for the intrauterine and cervical foci is effected by a sheet of thin rubber. The maximum dose is 1,400 milligramme-hours. As a rule fifty-five milligrammes of radium element are applied for twenty-four hours.

Accessory treatment consists of fulguration, cataphoresis and the application of "Dextrocide," an iodine-cerium preparation.

After the completion of the treatment the patient is given a leaflet with instructions in regard to the avoidance of injury to the irradiated skin. She also receives a card

on which is written the date on which she is required to return for further treatment or for examination. If a patient fails to keep the appointment, a letter is sent to her, explaining that it is in her own interests for her to return. Other means are adopted to keep the patients under continuous observation.

Results of Treatment.

From 1913 to 1928 2,203 patients with cancer of the cervix and 155 with cancer of the body of the uterus were treated at the University Gynæcological Clinic. Of the 2,203 1,319 were treated between 1913 and 1923 and of the 155 88 were treated up to 1923. These numbers represent the whole *clientèle* whose treatment was completed at least five years before the report was compiled. Of the 1,319 patients with cervical cancer 227 were in the first stage. Ninety-two or 40·5% were cured. If the material be divided into two groups, it appears that 39·3% of the patients treated by radio-active substances alone were cured, while 41·5% of those treated with radium and X rays combined were cured. It is further pointed out that fifty-four patients did not return for the second treatment. Not one of these patients was cured. It may therefore be claimed that of the remaining 163 patients ninety-two or 50·2% were cured. The survival rate among patients under thirty-five years of age was 28·5%, while that among patients over forty years was 48·5%. The results between the third and the fifth year after the termination of the treatment are practically the same.

There were 310 patients with cervical cancer in Stage II. Of these 69 or 22·3% were cured. Of those treated with radio-active substances alone 20·9% were cured, while of the patients treated by the combined method 23·5% were cured. Fifty-nine patients refused to undergo the second treatment; all died. Of the remainder 28·3% survived.

There were 543 patients with Stage III or inoperable cancer of the *cervix uteri*. Of these 58 or 10·7% survived after the five year period. The survival after radio-active substance treatment was 8·9% and after combined treatment 13·1%.

Lastly, there were 239 patients with Stage IV cancer of the cervix. Only three survived for five years.

Of the total number of patients with cancer of the cervix who underwent the full course of treatment, namely, 1,216, 222 or 18·2% were cured. Radio-active substances alone yielded 14% of cures, while radio-active substances and X rays yielded 21·4% of cures.

Cancer of the *corpus uteri* affected 88 patients and of these 36 or 40·9% survived. Of the patients treated with radio-active substances only 27·9% survived, while of those treated by the combined method 54·7% survived.

Professor Voltz is satisfied that modifications of the method of treatment and the careful carrying out of the plan of treatment will lead to still greater improvement in the results. The age factor cannot be influenced, but he is of opinion that the influence of the deleterious effect of poor social conditions may be partially eliminated by adequate after-care.

The University Radium Institute of Paris.

Dr. D. A. Lacassagne gives an account of the history of the Radium Institute of Paris. It was started in March, 1919, for therapeutic research into cancerous affections. At first it had neither premises nor access to hospital accommodation. The staff consisted of a few medical practitioners not specially trained in radiotherapy, who had not engaged in scientific research for nearly five years. Patients with inoperable growths of the uterus were treated at various public hospitals by radiotherapy. In August of the same year six beds at the hospital attached to the Pasteur Institute were placed at the disposal of the staff of the Radium Institute and emanation from a solution of one gramme of radium element was provided from Madame Curie's laboratory. At first tubes of radon emitting from twenty to forty millicuries were employed for treatment purposes. The primary filters were one millimetre of gold or two millimetres of silver and the tubes were wrapped in rubber or gauze. The tubes were applied against the cervix for from one to three days and the total dose rarely exceeded twenty millicuries destroyed, about 2,600 milligramme-hours. The radiation treatment was followed by hysterectomy whenever this was feasible. In 1920 the hospital accommodation was increased to six beds for women and nine for men. Dr. Henri de Rothschild presented the Radium Institute with half a gramme of radium. In 1921 the French Parliament made a grant of money to enable the Radium Institute to purchase twenty milligrammes of radium. The old Röntgen ray apparatus was replaced by up to date apparatus, including plant capable of being employed for deep radiation. About this time it was realized that the former methods had yielded unsatisfactory results. To a large extent radium replaced radon; larger doses were given and a trial was instituted with radium treatment combined with X ray treatment. In 1922 considerable extension was made of the hospital service. Further X ray plant was acquired. In the following years till further space was placed at the disposal of the Radium Institute for consultation and treatment purposes. The firm "Radium Belge" placed a gramme of radium at the disposal of the Curie Foundation, bringing the total quantity of radium available for treatment purposes up to 2·7 grammes. In 1924 further supplies of radium were obtained and the total amount reached 7·2 grammes. Eight sets of Röntgen ray apparatus were owned by the Radium Institution and the Curie Foundation by the end of 1927, including a portable set for bedside treatment.

The Radium Institution comprises three distinct units. The institute proper is housed with the Curie Foundation; one treatment service is housed in the hospital of the Pasteur Institute; a second treatment service is included in the Medico-Surgical Clinic. The Curie Foundation devoted to therapeutic work consists of two blocks, one with consulting rooms and laboratories and the other with Röntgen ray apparatus. The total number of available beds for the radiotherapeutic work is thirty-seven. The staff includes a surgeon, an ear, nose and throat specialist, a urologist and a dentist in addition to the five specialists in charge of the radiotherapy department. There is also a staff in the laboratories, including pathologists, bacteriologists and hæmatologists.

Of the stock of radium 5·85 grammes are in the form of radium salts and 1·35 grammes are in solution. Emanation is extracted from the solution and is used for the treatment of epithelioma of the skin or for making radium punctures with needles. Radon is no longer used for cancer of the *cervix uteri*. The X ray apparatus comprises a Gaiffe large model, constant tension generator fitted with Kenetron valves and condensers. The total current is thirty milliampères and the tension 200 kilovolts. There is one Veifa-Werke constant tension generator with a rotary commutator, with a total current capacity of sixteen milliampères and a tension of 200 kilovolts. There is another Gaiffe generator fitted with Kenetron valves and condensers yielding a total current of ten milliampères with a tension of 200 kilovolts. The fourth apparatus is a double coil Ropiquet generator with rotary mercury interrupter, yielding a total current of eight milliampères with a tension of 200 kilovolts. It feeds one set only; the Coolidge tubes are immersed in oil in the Gaiffe-Gallot-Pilon protective lead diaphragm. Other Gaiffe apparatus are available at the Pasteur Institute Hospital.

Method of Procedure.

The patients are examined by the surgeon at the Curie Foundation. A clinical diagnosis is made and when this is cancer of the *cervix uteri* and there is no contraindication to radiotherapy, a portion of the growth is removed by nippers for histological examination. All patients with cervical epithelioma are retained for treatment, except for certain clinical contraindications, if radiotherapy has already been applied elsewhere or if there is no available accommodation. The clinical contraindications are becoming less as the processes are being improved. General extension of the disease to the bladder, rectum or other organs, extreme cachexia and serious infective complications form the chief contraindications.

The treatment is usually started ten days after the examination. By that time the histological report is available. Patients admitted to the hospital attached to the Pasteur Institute are treated free of charge; sometimes a local authority may contribute to the cost of the treatment. Patients in the Medico-Surgical Clinic pay for the maintenance; those who can afford it, pay for their treatment as well. Full details are entered in the records of all patients admitted for treatment to the Radium Institute. Contact is maintained with all patients after discharge and examinations are carried out at defined intervals either in Paris or, if the patient resides at a distance, by a medical practitioner in attendance in collaboration by correspondence with the radiotherapist.

Principles of Treatment.

Dr. Lacassagne has set up the thesis that to cause the disappearance of a cancer by radiation it is necessary to apply the rays throughout the affected area in such a manner that they are equally distributed and that the dose is sufficient to destroy all the cancer cells. The site must be selected in such a manner that healthy tissues are not seriously injured. Two sets of factors are involved, the physical and the biological. In regard to the physical factors he points out that with internal irradiation the dose has been increased by the employment of many tubes properly situated. A total dose of eight thousand milligramme-hours can be tolerated without immediate or subsequent injury to surrounding organs. A strong primary filter of one millimetre of platinum and adequate secondary filtration are essential. Intrauterine and multiple vaginal application secures an intense crossfire irradiation. Radium needles have proved useless and are no longer used. Deep X ray therapy and radium-at-distance are being used in combination with internal irradiation. Surgery is now used only under very rare conditions. In regard to the biological factors he calls attention to the variations of sensitiveness of cells to therapeutic rays. A certain degree of resistance is acquired to radiation by neoplastic tissues; this increases with each repetition of the treatment. Infection exercises a deleterious effect on the process of cure.

Technique.

In all circumstances the patient is kept in bed at the start of the treatment and local disinfection by vaginal douches is carried out. If there is no rise of temperature at the end of twenty-four hours, the cervix is dilated. Great care is taken to secure asepsis. If there is a rise of temperature a bacteriological examination is carried out and appropriate means are adopted according to the result. If there is no infection, the radium is applied. As a rule two tubes containing 13·33 milligrammes of radium and one containing 6·66 milligrammes are inserted into the uterine cavity, while three similar tubes are applied in the vagina. The dose is calculated in terms of millicuries destroyed per hour. Full details are given in regard to the filtration and to the means adopted for keeping the tubes in the required positions. The treatment is continued for five days. During this period the dressings are changed every morning, the radium applicators are withdrawn and disinfected and the vagina is washed. No packing is needed after the end of the treatment. The patient is allowed to leave the hospital one or two days after the end of the treatment unless external irradiation is required. Information is given in regard to the procedure when the cervix is impermeable and if there is extensive infiltration of the vagina.

The technique employed for radium-at-distance and for deep X ray therapy is described in some detail. These matters cannot be reproduced in this place.

Results.

From the year 1919 to the year 1923 403 patients with epithelioma of the cervix were treated. The percentage of patients found to be cured at the end of five years is twenty. It has been pointed out that in 1919 unsatisfactory methods were being used. Of the 103 patients treated in that year only eleven or 10% were cured. The effect of the treatment improved year by year. The frequency of cure in 1920, 1921, 1922 and 1923 was 17%, 25%, 26% and 30% respectively. Seven patients have died later than five years after the completion of the treatment. In no instance was the death caused by the malignant disease.

A table is set up giving the number of patients treated for cancer of the cervix in the first, second, third and fourth stages. The frequency of cure as a result of treatment during Stage I is 42%, while the results are progressively less favourable in each succeeding stage. No patients survived when the treatment was not begun until the cancer had reached Stage IV.

Dr. Lacassagne concludes provisionally that radiotherapy of cancer of the cervix demands patience and persevering effort. There is every reason to hope that the progress achieved will be followed by further improvement in the frequency of cures.

Campaigns Against Cancer of the Uterus.

Professor Claude Regaud adds a chapter on the organization of and the conditions required for an effective campaign against cancer of the uterus. He deals in the first place with the question of the early diagnosis. The difficulties are that the lesions are invisible from the outside, that the first symptoms are insignificant and that it is necessary to resort to vaginal examination to discover the lesion. This is often repugnant to the patient and the medical practitioner is often not familiar with the signs. This constitutes the real difficulty of diagnosis. The means of promoting early diagnosis are public propaganda, improvement of gynæcological education and the general recommendation of a periodical examination of all women who have borne children. For the last purpose there should be in every town centres for gynæcological examination. Histological examination should be associated with the vaginal examination. He also advocated consultation centres and a few treatment centres. He insists on this point, for he finds that much special training is essential for success in connexion with radium and X ray treatment.

In discussing the relative merits of surgical treatment and radiotherapy he points out that the Radiological Subcommission is endeavouring to supply unimpeachable evidence in the form of statistics to determine the correct form of treatment for each form of malignant tumour. Every care is being taken to eliminate errors in estimating results and in arriving at a true evaluation of each kind of technique. Much has still to be discovered in regard to radiotherapy, particularly in regard to the biological problems.

He supposes that everyone will agree that surgical treatment of uterine cancer is extremely difficult and should not be attempted by anyone but a practised and experienced surgeon. He sounds a note of warning concerning the inadvisability of an untrained practitioner employing X rays or radium. The use of radium by practitioners insufficiently trained to this form of practice gives rise to a serious danger of therapeutic malpraxis. He disapproves of the hire of radium by a practitioner unless he has had considerable training at some recognized radium institution. The abuse of X rays is less actively harmful than the abuse of radium. There is no great temptation for a surgeon to treat with X rays patients who may be cured by surgery or by radium. For these and many other reasons which he sets forth in clear and fearless language, he advocates the concentration of treatment of cancer of the cervix in a small number of institutions and the provision of an equipment which would be complete and perfect in every respect. The necessity for such institutions is indisputable. He is not convinced that a few such establishments would suffice for the treatment of all patients and he doubts whether the public and the medical profession will be inclined to accept this centralization of the radiotherapy of uterine cancer. While he recognizes these difficulties, he is insistent on the correctness of his thesis until the treatment can be standardized and until more specially trained medical practitioners are available to undertake modern radium treatment.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at Saint Vincent's Hospital, Melbourne, on June 19, 1929. The meeting took the form of a series of clinical demonstrations by the members of the honorary staff.

Aortic Regurgitation and Hæmatemesis.

MR. J. FORBES MCKENZIE showed a patient who had complained of symptoms of gastric ulcer extending over many years, with previous attacks of severe bleeding, the last attack of which practically bled him white. Transfusion had been necessary and had picked him up a great deal. Operation had been decided on really on account of peculiar spasms from which he suffered, probably due to something of the nature of an hour-glass condition which had developed.

The deep ulcer demonstrated by X ray examination had been found at operation to be situated on the dorsal surface of the stomach and had been firmly attached to what would be considered to be the site of the cœliac axis artery. His condition on the table had been very bad and with the idea of giving some relief a posterior gastro-enterostomy had been performed.

It was very pleasing to see the improvement in this patient after what might be considered a procedure so far from the ideal. He slept well, could eat anything in reason and was rapidly throwing off the intense anæmia. The patient's skiagrams were demonstrated.

A Convenient Abnormality.

Mr. Forbes McKenzie showed a patient in whom a Meckel's diverticulum had been used to short circuit the bowel. The patient had first been seen about fifteen months previously, when she presented all the signs of approaching death from acute intestinal obstruction which had followed on a period of more or less chronic obstruction. A thorough investigation had failed to localize the cause of the obstruction. A caecostomy had been performed and the patient had recovered, but had been so dissatisfied with her artificial anus that with the idea of closing it a second operation had been performed, although it was not at all unpleasant. On exploration the obstruction had been found to be caused by a ring of new formation of undoubtedly not benign character in the sigmoid colon with a knuckle of small bowel firmly attached to it and involved in the change which had taken place in the large bowel. About twenty-five centimetres (ten inches) proximal to the obstruction there had been a Meckel's diverticulum about twenty centimetres (eight inches) in length. She had been such a poor subject for an extensive resection that it was determined to use this abnormality to short circuit the bowel. An anastomosis to the rectum had therefore been made and the patient had made an excellent recovery and had very soon complained that she was not getting enough to eat. Her bowel acted splendidly, although sometimes rather suddenly. She had resumed her ordinary activities and did most of her house work. The caecostomy opening had not closed; but as it scarcely discharged anything at all, the patient was quite satisfied and but for the ordinary disabilities of her age was very well.

MR. JOHN KENNEDY asked if any further operation was intended.

The patient answered she was quite content, that she was sixty-four years old, had an invalid husband and was very comfortable and that she might not be so easy after operation.

Spontaneous Fracture of the Neck of the Femur.

Dr. Forbes McKenzie also showed a male patient who had sustained a spontaneous fracture of the neck of the femur. There was absorption of the head of the femur and the causation of fracture was unknown. The patient had had pyrexia of sudden onset which had persisted for over three weeks with a septic looking chart. No cause for this pyrexia could be discovered. Blood examination, urine examination, X ray examination all failed to give the slightest information. Walking to his bath one day the patient had felt something crack and had found that he could not walk. He had had little or no pain anywhere at any time during his illness. X ray examination revealed the fracture of the neck of the femur and the radiologist had reported some unusual appearance around the acetabulum to which no definite name could be given. It was thought that possibly malignant disease was present.

From the time of the fracture the fever had gradually subsided and the patient's condition had improved and at the time of the meeting, nearly twelve months afterwards, he was very well and could walk without any splint with the aid of a stick or crutch. The interesting part of the history was that they had a skiagram of the femur taken before the fracture and it was impossible to foretell what was likely to happen. Of interest also was the absorption of the head of the femur which took place after the fracture, coincident with the subsidence of temperature.

MR. BASIL KILVINGTON suggested that secondary carcinoma possibly of the prostate was present.

MR. HAROLD DEW suggested as a possible diagnosis Paget's slow rarefaction of the bone; but qualified his diagnosis by saying that this condition was practically confined to the long bone shafts.

Gastrectomy for Ulcer of the Stomach.

Mr. Forbes McKenzie's last patient, aged thirty-six years, had been ill for four years. A year previously operation had been performed and the patient's abdomen had been closed, as the condition in the stomach appeared too advanced for anything to be done. She had, however, maintained her condition so well that it had been considered worth while exploring the abdomen again. Twelve months previously on opening the abdomen a second time a very extensive new formation had been found with the presence of enlarged glands right up the lesser curvature of the stomach. The stomach had been removed and it had been very difficult to suture the small portion left to the jejunum. After a transfusion and other slight incidents the patient had made an excellent recovery and at the time of the meeting looked very healthy and could do a lot of housework and was able to eat anything in reason.

The pathologist had reported the finding of chronic ulcer with some patches of suspicious looking cells. The skiagrams were shown.

Neurosyphilis.

DR. A. E. ROWDEN WHITE showed a man, aged sixty years, who had acquired a primary syphilitic sore forty years previously and had been treated by a pharmacist for a few weeks with medicine and pills. He had suffered no ill health until twelve months previously, when he had noticed that he was unsteady in walking and easily tripped and fell. He had been admitted into hospital a month previously, having collapsed at work on the day before admission. He had walked with difficulty and his gait had been of a spastic type. He had appeared to be confused and his mentalization had been slow. Examination had revealed hypertonus of all the limbs, but especially of the legs. There had been increased activity of all the tendon jerks and ankle and patellar clonus had been easily elicited. The plantar reflex had been of the extensor type on both sides. There had been no ocular changes nor any sensory disturbance. The Wassermann test had yielded a strong reaction. A full course of "Novarsenobillon" injections had been completed without any change in the blood reaction, but the patient manifested considerable improvement in his general condition. He was mentally alert, clean in his habits and walked fairly well. His tendon reflexes remained unchanged.

The second patient shown by Dr. Rowden White was a young man, aged twenty-two years, who had been

admitted to hospital during the third week in March, 1929, suffering from symptoms of a Jacksonian type of epilepsy which had first appeared seven weeks before admission. The onset had been sudden with a right sided twitching, pain and numbness of the thumb and forefinger of the left hand. This had been rapidly followed by stiffness of the left forearm and arm and an extension of twitching and numbness of the left side of the face. He had become unconscious for ten minutes, had not bitten his tongue and had had no incontinence of the urine or fæces. After nine days' rest in bed he had been able to resume work as a railway labourer. A month later he had had a recurrence of his signs and symptoms while at a picture theatre. On admission he had presented no abnormal neurological phenomena, except a hyperactivity of the tendon reflexes. There had been no sensory changes. The pupils, eye movements and discs had all been of a normal character. There had been no loss of power in any of his limbs, but there had been a slight left sided facial paresis. For several days he had had frequent attacks of twitching of the thumb and index finger. A partial reaction had been obtained in the blood to the Wassermann test, but the cerebro-spinal fluid had yielded a strong reaction. This had been interesting in view of the fact that the patient strongly denied venereal infection. When pressed on this point of his history in view of the response to the Wassermann test, he had confessed that he had suffered from a primary chancre fourteen months previously. He had been treated for three months at a venereal diseases clinic with intravenous injections and his blood had then failed to react to the Wassermann test. Soon after his admission to Saint Vincent's Hospital he had been given daily inunctions with *unguentun hydrargyri* and a course of seven intravenous injections of "Novarsenobillon." No reaction had then been obtained to the Wassermann test in either the blood or the cerebro-spinal fluid. The seizures had disappeared and his general condition had improved. It was interesting to note that a slight tremor which had developed shortly after admission, was much less.

Splenomegaly.

Dr. Rowden White's third patient was a single woman, aged twenty-eight years, who suffered from splenomegaly. This had been discovered in the course of a general examination, as she had noticed that her ankles and legs had been swollen for three or four months. Her heart and kidney systems had presented no abnormality, but the blood picture had been typical of chronic myelocytic leuchæmia with a leucocyte count of 215,000 to the cubic millimetre. The spleen had extended to below the level of the umbilicus. She had been given benzol in one mil (fifteen minim) doses three times a day and the spleen had been irradiated once a week for five weeks with little or no change in the patient's condition or blood picture. Then a long bone (a limb) had been irradiated one week and another limb the following week and so on for four weeks with a progressive fall in the white count to 51,000 per cubic millimetre and a considerable reduction in the size of the spleen. There had been an improvement in the hæmoglobin value and in the number of erythrocytes.

Diabetes Insipidus.

Dr. Rowden White also showed a woman, aged fifty-three years, who had been admitted to hospital on account of *diabetes insipidus*. None of her organs had presented any abnormality. X ray examination of the skull had failed to reveal any abnormality of the *sella turcica*. She had passed nearly eleven litres (two and a quarter gallons) of urine in the twenty-four hours. The specific gravity of the urine had been 1004 and it had contained neither albumin nor sugar. The systolic blood pressure had been 130 millimetres of mercury. She had been given one cubic centimetre of "Infundin" and the unquenchable thirst and polyuria of four months' duration had dramatically disappeared; the quantity of urine had dropped to normal. This had been maintained by daily doses of 0·5 cubic centimetre and later by the same dose given on alternate days. She had then been allowed to go home to the country, using three times a day a snuff containing 0·03 milligramme (one two thousandth of a grain) of posterior lobe extract of pituitary gland. She had reported on the night of the meeting that the snuff had been unsatisfactory and that there had been a gradual return of her former complaint during the past few weeks.

Pulmonary Conditions.

Dr. White also showed two women, one of whom was suffering from a spontaneous pneumothorax and the other of whom had bilateral pulmonary fibrosis in *phthisica sicca*. He demonstrated X ray films to confirm the physical findings.

Chorea.

DR. SYDNEY PERN showed two girls of fourteen years of age who were suffering from chorea. One had some enlargement of her thyreoid. This patient had had infected tonsils which had been enucleated in November, 1927. By February all her movements had ceased. A year later she had come again with a return of her movements. She also complained of a right frontal headache in the mornings, but no history of any yellow drip in the naso-pharynx. In spite of that she had been given a few injections of colloidal manganese which quickly relieved her headaches and caused a cessation of all movements. The only medicine she was taking was *syrupus ferri phosphatis*.

The other patient had come on May 10, 1929. Her history revealed that she had been in Saint Vincent's Hospital five years previously for the same thing and was an in-patient for sixteen weeks. She had had her tonsils enucleated for repeated sore throats two years previously and an operation for osteomyelitis of the tibia two months previously. Examination had revealed no visible focus of infection, but her urine had indicated definite pyelitis. This had responded to treatment with hexamine and sodium acid phosphate and her movements had rapidly ceased.

Aortic Aneurysm.

Dr. Pern's next patient was a female, aged sixty years, who was suffering from aortic aneurysm. She had had two years of pain to the right of the sternum which was thought to be due to neuritis. There was an obvious pulsating tumour in the second right intercostal space. She had been given twelve "Bismuthoidal" injections with iodides and mercury by the mouth. Her pain had almost gone, the tumour was less noticeable and her general cardiac condition much improved.

Exophthalmic Goitre.

The next two patients shown by Dr. Pern were a mother and daughter who suffered from exophthalmic goitre. The mother had come for treatment in February, 1925. She had been extremely ill for twelve months. She had had auricular fibrillation and sinus infection with yellow post-nasal discharge. Four injections of colloidal manganese had cleared this up. She had had five injections of emetine hydrochloride which steadied up her nervous symptoms, as well as some X ray treatment to her thyreoid. Her fibrillation had ceased one month from starting treatment and by May, 1927, her pulse rate had been 88 in the minute. She gained 6·3 kilograms (one stone) in weight in twelve months. In July, 1925, she had had a slight return of her nasal trouble with a corresponding flare up of her goitre symptoms which cleared up after a few injections. She had been taking Lugol's solution for ten weeks. She had been quite well for the last three years. It would not be supposed that she had had a goitre.

The daughter, aged twelve years, had been brought up for treatment in November, 1927. She had had an enlarged thyreoid, exophthalmos and thyreotoxic symptoms. She had weighed 33 kilograms (five stone three and a half pounds) and had had a pulse rate of 124. She had been extremely nervous and inclined to vomit. Her tonsils and sinuses had been infected. Colloidal manganese had

been given for her nasal trouble, her tonsils had been treated and some X ray treatments had been given to her thyreoid. By March, 1928, she had been very well and by the middle of May, 1928, had gained 6·3 kilograms (a stone) in weight and her condition was satisfactory in every way.

She had returned in September with a recurrence of the old symptoms. Her tonsils had been enucleated, but in spite of this she had not made the improvement hoped for. It had then been found that a piece of the lower pole of the tonsil was present. This had been removed and she had steadily improved. In October, 1928, the pulse had been becoming quieter. In the middle of November its rate had been down to 96.

She had been well then to February, 1929, when she had caught a cold which caused a flare up in her old sinus condition. Her pulse rate had been 130. Her urine at this time had manifested bacilluria and a trace of albumin. She had been given some further injections of colloidal manganese which on this occasion had failed to clear up the sinusitis, and an X ray examination had revealed a mass of polypoid tissue in the left antrum and the right one had been completely dense.

In the next three weeks she had become acutely ill with a pulse rate running between 130 and 140. The question which had had to be decided, was whether she ought to have partial thyreoidectomy done to save her life and have the antra attended to later or whether the antra should be operated on in the hope that the clearing up of that infection would reduce her toxic symptoms. Influenced largely by past experience, the operation on the antra was decided upon. It had been left to the discretion of the operator and the anæsthetist as to whether one or both antra be operated on at one time. Both had been done. For the next few days her condition had caused considerable anxiety, due to the toxic absorption and general shock. She had left hospital weighing 25·2 kilograms (four stone). She had lain quietly at home, slowly picking up and except for some fæcal obstruction which caused a sharp upset, she had steadily improved. In the next three weeks she had put on 6·7 kilograms (fifteen pounds) and 1·1 kilograms (two and a half pounds) since. There was still some lurking pyelitis which was keeping her pulse up to 130 at times.

Huntington's Chorea.

DR. JOHN F. WILLIAMS showed a man, aged forty years, of Danish extraction, who for the past two years had complained of increasing difficulty in walking. During the same time his relatives had noticed a change in personality and restlessness.

His father had died in a mental hospital at the age of forty-seven years of a complaint with similar onset. The mother was alive and healthy. The family history farther back was unknown on the father's side. The mother's family was healthy. The patient was the eldest of three children who were apparently healthy. He was married and had one healthy child.

Examination revealed widespread, massive, irregular movements, involuntary, but partially controlled by attention and certain attitudes, for example, sitting hunched up. These were more pronounced following voluntary movement. Mentally there was definite dulness and irritability with lack of cooperation in examination. There was no definite anxiety and the mental state did not seem to be due to realization of his condition. No evidence of hallucinations or delusions was elicited. Physically there was some hyperactivity of tendon reflexes, but no other abnormality of the central nervous system was revealed in routine examination. The Wassermann test yielded no reaction in blood or cerebro-spinal fluid. The latter was clear and under no increased pressure and normal in other respects.

The patient was shown by the courtesy of Dr. J. G. Hayden as an example of Huntington's chorea.

Dr. Williams also showed a man with a post-traumatic cerebellar lesion. Trauma seven years previously had been very severe and associated with bilateral pyramidal signs. These had cleared up, leaving cerebellar signs much more pronounced on the right side. The signs were typical of a gross cerebellar lesion with the exception that no nystagmus was elicited. Efforts to compensate for cerebellar lack by cerebral control could be noticed in the attitudes adopted in performing movements, for example, the elbow pressed to the side in the finger-nose test. The blood yielded no reaction to the Wassermann test. The cerebro-spinal fluid had not been investigated. X ray examination of the skull revealed no abnormality. The question of the advisability of exploration was discussed.

"Lipiodol" and the Fallopian Tubes.

MR. A. NORMAN MCARTHUR showed some X ray pictures of the uterus and salpinges injected with "Lipiodol." For diagnostic purposes he preferred "Lipiodol." There was a permanent record of the capacity of the tube, its direction and its patency or otherwise.

He thought that Rubin's insufflation was more effective in the therapeutic results when spasm of tubes had to be overcome, where a tube partially occluded had to be opened and its opening maintained and after salpingostomy to prevent the tubes becoming occluded until healing was properly established.

Genital Prolapse.

Dr. McArthur showed also a cinema film revealing his method of dealing with *prolapsus genitalia*. Dr. Sydney Crawcour had taken the film with the small hand camera, so popular with amateurs and supplied by the Kodak Company. He felt a little diffident showing this film after seeing last week at the Alfred Hospital such excellent films produced by Mr. Trinca and demonstrated from a patient of Mr. Fowler. Mr. Trinca had used a large standard camera. This produced an excellent picture and Mr. Fowler had told him that no artificial light was used, in fact on that particular day when taken there had been a dull light. Dr. Crawcour had had to use lights of over two thousand candle power.

He thought that it was time that every teaching hospital was provided with a standard cinema camera and kodoscope for the use of the staff, when films could be used for purposes of instruction. As the film was produced Mr. McArthur said that the forceps in his hand pointed out in sequence as Maguire, of Sydney, had taught that in *prolapsus genitalia* the bladder, the entrance of ureters to bladder and Douglas's pouch were extravaginal. The point of interest in the film which he would like to accentuate, was that after denudation of the mucous membrane of the anterior vaginal wall the bladder was pushed up from the cervix and anchored into its more elevated position. This suture, when properly applied, threw the uterus into a normal anteverted position. Interrupted sutures were used and it was necessary to keep the anterior vaginal wall as elongated as possible. The film then showed the circular amputation and coning out of the cervix to the internal *os*. The double-over suture for uniting the peripheral vaginal mucous membrane to the cervical canal was different from that excellent suture used by Mr. Fowler. In the colpo-perineorrhaphy he pointed out his method of raising the posterior vaginal mucous membrane from the recto-vaginal fascia, starting from below upwards, whereas Mr. Fowler started from the cervix downwards, getting a better hæmostatic result. Denudation of this large amount of mucous membrane reaching to the cervix tightened up the upper reaches of the cervix. Two layers of catgut sutures pulling together the *levatores ani* and recto-vaginal fascia and a continuous suture to the denuded mucous membrane completed a very extensive colpo-perineorrhaphy. The slogan followed throughout was to "restore the normal axis of the genital canal and to overdo the repair rather than underdo it."

Pituitary Tumour.

DR. J. FRANK SPRING showed a patient with optic atrophy, which he considered was due to a pituitary tumour. The right disc was atrophic and the vision in this eye was bare perception of light. The left eye showed partial

atrophy of the disc and had $^{6}/_{60}$ vision. The Wassermann test had yielded no reaction. An examination of the nose revealed no abnormality. No septic focus could be found throughout the body. The right field could not be tested by reason of the defective vision. The left field showed almost complete loss of vision on the temporal side. The nasal side was restricted, but not nearly to the same extent as the temporal. The fields for red, blue and white were similar in size. An X ray examination revealed definite abnormality of the pituitary fossa.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

Dalgarno, Marjorie Clare, M.B., Ch.M., 1925 (Univ. Sydney), 44, South Parade, Campsie.

Smith, Frederick William, M.B., 1928 (Univ. Sydney), Gardener's Road, Rosebery.

Correspondence.

MALARIAL THERAPY.

SIR: I read with interest the correspondence by Dr. C. A. Hogg and Dr. Ellery published in your journal on September 21, 1929, and October 19, 1929, respectively, relating to malarial therapy in Australia.

As far I as am aware, the first successful inoculation of general paralytics in New South Wales by malaria was carried out at Callan Park Mental Hospital by Dr. Latham, Pathologist to the Mental Hospitals Department, on October 25, 1926. On this occasion four patients were inoculated and subsequently two others. I was asked to undertake the treatment of these patients while under the supervision of Dr. Wallace, Medical Superintendent, Callan Park. This strain, obtained from the Royal Prince Alfred Hospital and apparently similar to the one obtained by Dr. Ellery from the Melbourne Hospital in May, 1927, was found to be a mixed infection, unsuitable and was discontinued, the two subsequent cases inoculated as mentioned above having their attacks aborted by the intravenous administration of a soluble salt of quinine. One of the four cases allowed to have pyrexial attacks with this strain was discharged recovered from the hospital and his case was written up in a sensational manner by one of the Sydney newspapers. Dr. Ellery appears to be correct in his belief that the series inoculated in Victoria on April 26, 1925, were the first successfully inoculated patients in Australia.

Yours, etc.,

GREY EWAN,
Medical Superintendent.

Mental Hospital, Newcastle.
October 21, 1929.

PROLAPSUS UTERI.

SIR: In your issue of November 2, 1929, Dr. Frank A. Nyulasy, of Melbourne, takes exception to my statement as reported on page 496 of your journal, made at a session of congress.

My remarks were correctly reported and were to the effect, speaking of the treatment of *prolapsus uteri*, that "operations directed at the cardinal ligaments, involved a dissection nearly as great as that involved in Wertheim's operation." This is to some extent an exaggeration for the purpose of stressing the difficulties of the dissection, but I followed the very words of Sir Victor Bonney in comparing it with Wertheim's operation, when speaking to the Medical Science Club during his visit to Sydney. His views expressed at that time coincided with my opinion that such operation is unnecessarily extensive for a mechanical defect which can be dealt with effectively by ventrosuspension.

I have the greatest respect for the work and opinions of the late Arthur Nyulasy, but am strongly of the opinion that the object for which his operation is designed, the taking up of the slack in the vaginal vault, can be as effectively and much more safely and quickly attained by ventrosuspension. These two methods are the only means by which this slack can be taken up.

This operation of ventrosuspension has been subjected to an extraordinary amount of criticism for many years and has many enemies in Sydney who would not be slow to bring to notice any cases of dystocia caused by it.

Dr. Fowler, of Melbourne, mentioned four cases of dystocia following ventrosuspension, but on the other hand this operation has been performed by Dr. George Armstrong and other members of the staff of The Women's Hospital for many years without any case of dystocia coming to our knowledge and a great number of these cases have been subsequently confined in our wards. Care is necessary in several small but important points in the technique, especially as to the level of insertion of the stitches.

In conclusion, while I admit that the comparison with Wertheim's operation is an exaggeration, this does not avoid the conclusion that the difficulties and dangers of "looping the cardinal ligaments" are far greater than those of ventrosuspension and I am convinced that the operation is too extensive and consequently dangerous for a mechanical condition that can be effectively dealt with by other and simpler means.

Yours, etc.,

H. C. E. DONOVAN.

195, Macquarie Street, Sydney.
November 1, 1929.

SHOE SALESMEN AS RADIOGRAPHERS.

SIR: At least one Sydney retail department store has an X ray apparatus to which customers stand to have their feet screened to see the position of their bones in the shoes which they contemplate purchasing. A notice is on the machine warning the operator as to the length of time exceeding which the current must not be continuously switched on. However, even with an exposure of five seconds to each pair of shoes, a faddy customer trying on many shoes could have quite a long exposure to the rays.

Is there any risk of X ray burn on the feet and is there any danger of the faddy customer being rendered sterile?

Business houses today have advanced to the extent of having staff psychologists, staff chiropodists *et cetera*. One does not know if a trained radiographer is kept in the retail shoe stores. If not, one would like to read the published opinion of the public health authorities as to the wisdom of allowing the use of an X ray apparatus to be in the hands of shop assistants.

Yours, etc.,

"INQUISITIVE."

November 1, 1929.

Obituary.

FRANK HART BARKER GADEN.

WE regret to announce the death of Dr. Frank Hart Barker Gaden which occurred at Sydney on November 14, 1929.

ADDENDUM.

WE regret that the following was omitted from the article on focal infections and arthritis by Dr. R. V. Graham, published in THE MEDICAL JOURNAL OF AUSTRALIA, November 9, 1929, page 665.

Acknowledgement.

I wish to acknowledge my indebtedness to my colleague, Dr. N. D. Royle, for permission to use records of his cases and to Professor Stump for permission to use some of his original lantern slide preparations.

Books Received.

A SYSTEM OF BACTERIOLOGY IN RELATION TO MEDICINE: Volume III, by Various Authors; 1929. London: His Majesty's Stationery Office. Crown 4to., pp. 413. Price: One guinea.

PATHOGENIC MICROORGANISMS: A PRACTICAL MANUAL FOR STUDENTS, PHYSICIANS AND HEALTH OFFICERS, by W. H. Park, M.D., A. W. Williams, M.D., and C. Krumwiede, M.D.: Ninth Edition, Enlarged and thoroughly Revised; 1929. Philadelphia: Lea and Febiger; Royal 8vo., pp. 819, with illustrations. Price: $6.50 net.

COLLECTED PAPERS OF THE MAYO CLINIC AND THE MAYO FOUNDATION. Edited by Mrs. M. H. Mellish, Richard M. Hewitt, B.A., M.A., M.D., and Mildred A. Felker, B.S.; Volume XX; 1929. Philadelphia: W. B. Saunders Company. Melbourne: James Little. Royal 8vo., pp. 1210, with illustrations. Price: 60s. net.

Diary for the Month.

Nov. 26.—New South Wales Branch, B.M.A.: Medical Politics Committee.
Nov. 26.—Illawarra Suburbs Medical Association, New South Wales (Annual).
Nov. 27.—Victorian Branch, B.M.A.: Council.
Nov. 28.—New South Wales Branch, B.M.A.: Branch.
Nov. 28.—South Australian Branch, B.M.A.: Branch.
Dec. 3.—Tasmanian Branch: Council.
Dec. 3.—New South Wales Branch, B.M.A.: Ethics Committee.
Dec. 4.—Victorian Branch, B.M.A.: Annual Meeting; Council.
Dec. 4.—Western Australian Branch, B.M.A.: Council.
Dec. 5.—New South Wales Branch, B.M.A.: Branch.

Medical Appointments.

Dr. Whitfield De Witt Henty (B.M.A.) has been appointed Acting Medical Superintendent at the Hospital for the Insane and Receiving House, Royal Park.

* * *

Dr. Thomas Grenville Clarence Retallick (B.M.A.) has been appointed Acting Medical Superintendent of the Hospital for the Insane, Beechworth.

* * *

Dr. F. L. P. Sawell (B.M.A.) has been appointed Medical Officer of Health of the Claremont Municipal Council, Western Australia.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xvi.

ALFRED HOSPITAL, MELBOURNE: Medical Superintendent.
INSPECTOR-GENERAL OF HOSPITALS DEPARTMENT, ADELAIDE HOSPITAL: Honorary Anæsthetist.
LAUNCESTON PUBLIC HOSPITAL, TASMANIA: Resident Medical Officer (male).
MONTAGU MEDICAL UNION, TASMANIA: Junior Medical Officer.
REPATRIATION COMMISSION, MELBOURNE: Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 21, Elisabeth Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company, Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Mount Isa Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.